Ontario

Minister of Natural Resources

Annual Report

1979

Annual Report

of the Minister of Natural Resources
of the Province of Ontario
for the fiscal year ending March 31, 1979
$1.00

TO HER HONOUR
The Lieutenant-Governor
of the Province of Ontario

MAY IT PLEASE YOUR HONOUR
The undersigned begs respectfully to present to your Honour the Annual Report of the Ministry of Natural Resources for the fiscal year beginning April 1, 1978, and ending March 31, 1979.

James A. C. Auld

JAMES A. C. AULD
Minister

Ministry of
Natural
Resources

Ontario

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Highlights

- The total value of mineral production in Ontario in 1978 was $2.6 billion.
- The Pits and Quarries Control Act applies in 278 designated townships; about 1,600 licences to operate pits and quarries have been issued.
- "Towards a Nickel Policy for the Province of Ontario" was published as Mineral Policy Background Paper No. 4.
- "Investment Effects on the Mineral Industry of Tax and Environmental Policy Changes: A Simulation Model" was published as Mineral Policy Background Paper No. 5.
- Two programs were begun to stimulate mineral exploration — the six-year Northern Ontario Geological Survey and the five-year Kirkland Lake Initiatives Program.
- Payments under the Mineral Exploration Assistance Program were $435,467, bringing the total government expenditure since 1971 to $2,983,322.
- Grants of more than $400,000 were awarded to 10 universities under the Ontario Geoscience Research Grant Program.
- The Ontario Geological Survey sent out 53 field parties in 1978 to map and record geological formations.
- A total of 1.637 million m^3 (5.78 million cunits) of wood was harvested on Crown lands; their value at time of measurement was $35.9 million.
- On Crown lands 239,729 ha (592,390 acres) received silvicultural treatment.
- Ontario's forests were planted with 58 million trees raised in Ministry nurseries.
- Agreements with private landowners under The Woodlands Improvement Act increased by 746 to 6,935, bringing 127,413 ha (314,843 acres) under agreement.
- Under the Forestry Act, forests managed by agreements with municipalities, Conservation Authorities and the Government of Canada increased by 658 ha (1,626 acres) to 108,500 ha (268,109 acres).
- In the continuous inventory of Ontario's forests, 168,300 km^2 (65,000 square miles) were covered by aerial photography.
- Visitors to provincial parks numbered 9,348,000 in 1978; the number of campers was 1,430,751.
- The number of provincial parks increased by two to 128 with the opening of two natural environment parks — Fathom Five, near Tobermory, and Awenda, near Penetanguishene.
- The Ministry managed 24,000 km (15,000 miles) of canoe routes in provincial parks and on other Crown lands.
- About 1,400 water access points were maintained on public land for boaters.
- Under the winter trails recreation program, $500,000 was made available in grants to private clubs and Conservation Authorities for the grooming and maintenance of 12,900 km (8,000 miles) of snowmobile and ski trails.
- The Ministry has developed a new trap, a foot-snare, which has been used to live-trap coyotes, foxes and raccoons with relatively little injury to the animals.
- A total of 587,643 hunting licences was sold to Ontario residents and 31,767 to non-residents in 1978.
- Hunters donated 11,000 deer and moose hides to native craftsmen.
- A total of 38,500 new hunters was trained in 1978, bringing to 490,798 the number trained since 1957.
- The wild fur pelts taken by 14,725 trappers were valued at $11.3 million.
- The commercial fish harvest in 1978 was 22.1 million kg (49.1 million pounds) valued at $15.4 million. Lake Erie accounted for 70 per cent of the catch and 60 per cent of its value.
- Ontario waters were stocked with 6.1 million fish raised in Ministry hatcheries.
- In a continuing inventory, 549 lakes and 480 km (300 miles) of streams were surveyed.
- Grants to Conservation Authorities under The Conservation Authorities Act amounted to $33,330,808.
- Crown cottage lots, offered by lease in recent years, were made available for purchase by eligible applicants.
- A total of 2075 ha (5,128 acres) of private land was acquired for government purposes, bringing the acquisition since 1962 to 255,003 ha (630,128 acres).
- The Ministry maintained 8345 km (5,182 miles) of resource access roads.
- The Ontario Basic Mapping Program was officially implemented, and a Basic Mapping Section was established.
- The second precise calibration base line in Ontario was installed in Scarborough (the first is in Mississauga).
- Aerial thermographic coverage of Peterborough was completed and the thermographs of individual houses were presented to owners.
- Sixty-six regulations and 483 Orders-in-Council were prepared and processed.

Goal

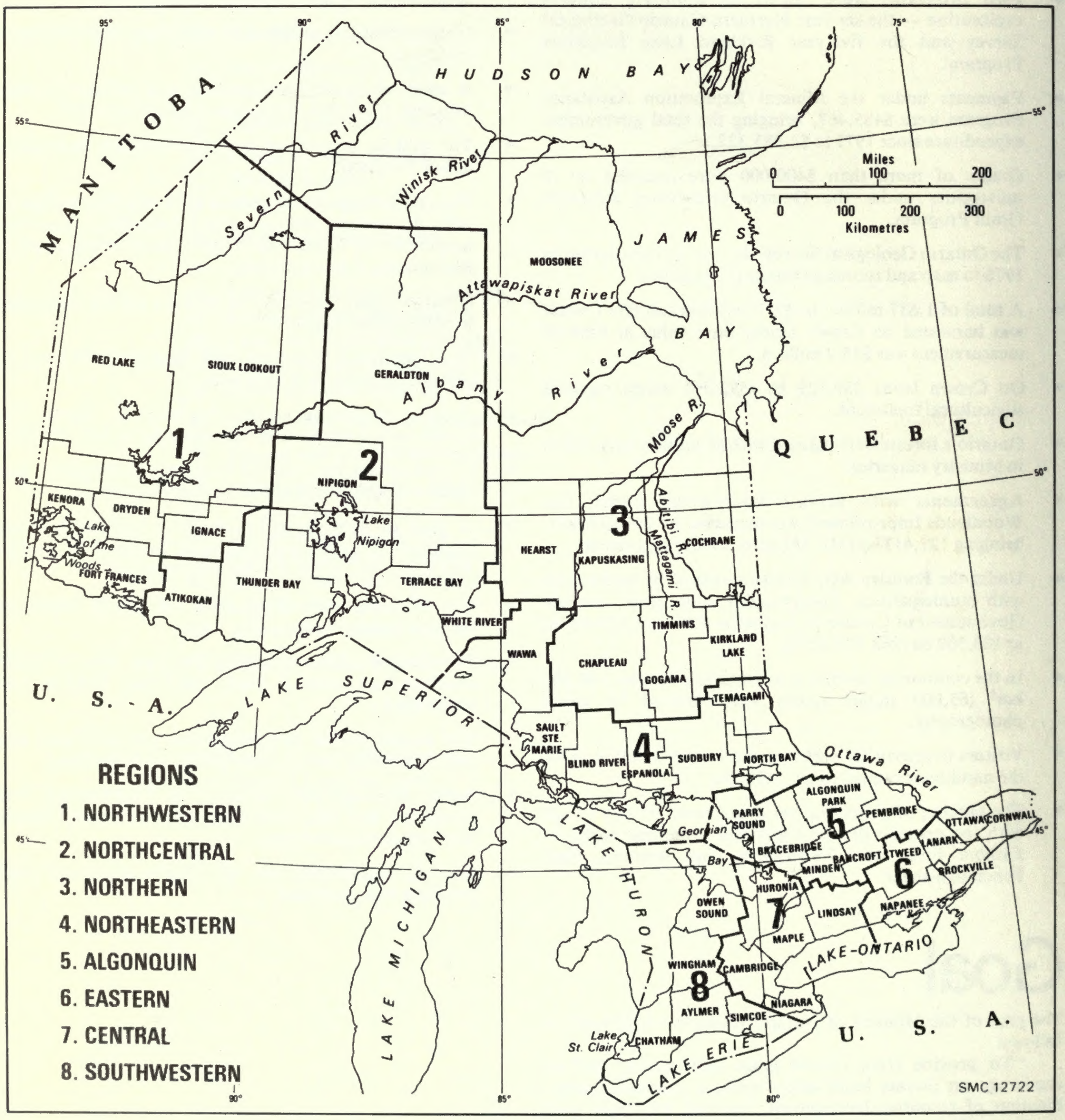
The goal of the Ministry of Natural Resources is defined as follows:

"To provide from Crown lands and waters, and to encourage on private lands and waters, a continuing combination of resource development, outdoor recreation and quality environment most consistent with the social and economic well-being of the people of Ontario."

Ministry Operational Organization

The Ministry of Natural Resources is organized functionally and geographically so that the authority for operational decision-making is placed as close as possible to the program delivery level.

While the field organization of the Ministry directly provides services to the public, Main Office is responsible for monitoring, co-ordination, policy development, operational review and the comptrollership function.



Field Organization

The Ministry of Natural Resources is organized functionally and geographically so that the authority for operational decision-making is placed as close as possible to the program delivery level. For administrative purposes, Ontario is divided into eight regions and 49 districts. The district managers, regional directors and field assistant deputy ministers are the line managers responsible for implementing the Land Management, Outdoor Recreation and Resources Products Programs of the Ministry.

Each regional office is organized into functional units headed by specialists responsible for providing advice and support to the districts. In some instances — such as conservation authorities, mineral management, engineering and administrative services — the regional office is also the delivery point for Ministry programs.

The primary role of the regional director and his staff is to direct and co-ordinate the work of the districts by establishing regional priorities and allocating appropriate resources to meet these; by establishing program standards and subsequently auditing to ensure the standards are met; by developing training programs and ensuring they are implemented; and by providing specialized advice and support services. In addition, the Regional Director and his staff recommend to main office annual work plans and identify areas where policy is required or needs to be modified.

Districts are the basic line units of the Ministry organization where the management and use of natural resources takes place with consideration of local requirements. District managers are responsible for the preparation of local land use plans and for the integration of individual resource plans that are consistent with the land use plan. Each district manager is responsible to the appropriate regional director for all activities assigned to the district.

The four northern regional directors and the Aviation and Fire Management Centre director report to a field assistant deputy minister at Thunder Bay; the four southern to one located at Toronto. The two field assistant deputy ministers are assigned line responsibility, authority and accountability for program management. In addition, they reflect field positions through membership on the Policy and Priority Committee.

Policy and Priorities Office

The Policy and Priorities Office is responsible for the following:

The corporate development of co-ordinated policies to ensure integrated resource planning and management; and

The establishment of integrated but flexible Ministry and program priorities.

Policy Co-ordination Secretariat

The Policy Co-ordination Secretariat:

— Provides co-ordination, integration and communication services with regard to policy planning to the main office groups and to the regions to assist them in achieving the Ministry's objectives;

— Provides staff support to the Policy and Priorities Committee, the Minister's Policy Committee and other senior-level committees as required;

— Supports the production of new policy initiatives in conjunction with the relevant main office and regional staff;

— Provides support, advice and information to the main office groups and regions in assessing long-range policy needs and directions in the context of the Ministry's mandate and government objectives;

— Ensures the widest and earliest possible multi-functional consideration of policy proposals being developed within the Ministry;

— Co-ordinates the process for development of new legislation;

— Ensures the necessary liaison with Cabinet and its committees, and with other Ministries; and

— Undertakes special policy co-ordination assignments at the request of the Chairman of Policy and Priorities Committee.

Program Analysis Office

The Program Analysis Office:

— Conducts and co-ordinates cost-effectiveness studies relating to Ministry programs and proposals (these studies aid in setting priorities for programs and assist main office groups and regions in achieving Ministry objectives);

— Co-ordinates the program planning and priority setting process in the Ministry and liaison with central agencies on Ministry estimates (this includes participation in the development of the Ministry's Management by Results commitments);

— Co-ordinates liaison with Management Board of Cabinet and its Secretariat on matters dealt with by the Board;

— Ensures necessary liaison with other Ministries for programs such as Regional Priority where the Ministry of Natural Resources carries out programs on behalf of other Ministries; and

— Provides support to the Policy and Priorities Committee and the Minister's Policy Committee in the analysis and development of the program aspects of policy issues, and assists in the development of methods of assessing relative priorities among programs by the Committee.

Program Management Evaluation

Program Management Evaluation is a short-term staff function, established in April, 1978, to assist the Deputy Minister to improve Ministry performance by carrying out specific tasks as follows:

To provide over-all guidance in the development of a Ministry management system;

To ensure the development of a reliable, comprehensive information system to serve the needs of managers at all levels;

To ensure improvement of the Ministry's output measures and its formal Management-by-Results (MBR) system; and

To foster an improvement in general managerial skills and approaches, to effect a more business-like operation with increased emphasis on effectiveness and efficiency.

During the fiscal year, activities were mainly concentrated on the elements of the management system, MBR and operational audits.

A system of formalized operational audits was launched throughout the Ministry through the development of procedures and the conducting of two major workshops for audit co-ordinators. By year-end, field and program staff had completed approximately 60 audits under this system.

MBR mid-year and year-end reports were prepared for the Deputy Minister and Management Board, and assistance was extended in integrating the MBR system with the Work Planning System.

Management Improvement Office

Organization

The organizational design for the Ministry was established and the changes required were to be accomplished in two stages.

In Stage I, the reorganizational changes were carried out in three steps and resulted in a reduction of ten senior staff positions.

In Stage II each Group, where viable, will be restructured on a Planning, Management and Service basis rather than the present activity basis.

Utilization of Human Resources

A report was submitted by a committee making recommendations on the utilization of human resources. A coordinator has been appointed to implement the approved recommendations.

Resource Planning System

A committee was appointed to clarify the role of the Ministry's Natural Resources Planning System within the over-all Planning and Management System. The committee produced a report clarifying the system. The report defines the parts of the system and outlines their relationship to other parts of the corporate planning system, e.g. annual work plan, policies and priorities, performance evaluation, etc. It also sets out terminology, planning responsibilities and approval process at all levels.

Target dates were set for completion of the plans at various levels. District staff were identified to develop local Land Use Plans which will provide the framework for the local resource plans such as Forest Management plans.

Management Improvement Projects

Main Office Staff Reduction

On November 24, 1977, the Deputy Minister proposed to reduce main office staffing by 20 per cent (about 200 positions). As of March 31, 1979, the net reduction of main office staff was 88 of which 22 were decentralized to field offices.

Accounts Payable Procedures

A committee examined the accounts payable procedure in field offices in an effort to reduce the time required to process invoices. All but one of the committee's 18 recommendations are being implemented.

Consolidation of Main Office Administrative Units

A committee studied the feasibility of consolidating branch and group administrative units with the existing service branches, e.g. Personnel, Administrative and Financial. The recommendations made are being reviewed.

Information Services

A one-man task force was assigned the task of examining the Ministry's public communications program in an effort to determine how to better inform the public about Ministry activities as well as examine other programs under the Information Services Branch.

As a result of the recommendations made, the reporting relationship of the three Ministry libraries was changed so that the Mines library becomes the responsibility of the Mineral Resources Group and the Resources library (Whitney Block) and the Research library (Maple) becomes the responsibility of the Outdoor Recreation Group.

A committee was appointed to develop a communications plan for the Ministry. Other recommendations made are still under consideration.

Research Study

A study group was assigned the task of examining the relevancy, funding and results of the research and development program in the Ministry. The recommendations made in the group's report are under active consideration.

Private Sector Review

A report has been received from a committee which was assigned the task of identifying processes and other factors inhibiting the use of the private sector. The recommendations made are under review.

Delegation of Authority

A study was undertaken to determine what areas of authority should or could be delegated to field offices. The first phase of the report has been received, and the recommendations made are in the process of being implemented.

Managers' Training Seminar

As a result of the many recommendations implemented, there have been considerable changes in systems and organization. This has created a need to inform and update managers. As a result a Managers Training Seminar has been developed and is scheduled for implementation in the fall of 1979.

Forest Resources Branch

The objective of the Branch is to produce optimum and continuous industrial, social and environmental benefits from the public forests and to encourage and assess similar production on private lands in Ontario.

Ontario Forest Research Centre

The Ontario Forest Research Centre, with headquarters at Maple and four field research units, continued to provide scientific and technical knowledge and information needed for effective management of forest resources in Ontario.

Research activities are focused on biological aspects of growing the new forest for a variety of uses. Studies are not only carried out by the scientists of the Centre, but contracts are also let to universitites, industries and individuals, and co-operative programs are under way with the Canadian Forestry Service and other institutes. The kinds of research projects range from rather basic scientific investigations to technological developments, but all are oriented towards improvement of knowledge in the service of resource management.

Important team work has been under way for some time to improve the genetic characteristics of plant materials to increase growth and resistance to diseases and pests. The breeding research has resulted in new hybrids in poplar and spruce. Methods in organic chemistry are being tried to identify compounds which might indicate the potential growth characteristics of new hybrids at an early stage of plant development.

Other related studies deal with the rooting of cuttings, tree nutrition, the production of biomass, the use of hybrid poplar leaves as a source of protein, and the possible losses of nutrients in intensive forest management and harvesting systems. Close co-operation is maintained with field personnel not only for the establishment of field tests, but also to make the genetically improved plant material available for mass propagation and operational plantations.

The valuable but relatively small amounts of genetically improved plant material require new, more efficient techniques and systems of plant propagation and distribution to field locations for artificial regeneration of the forests. Studies deal with seed production, an automated system for using pregerminated seed in a greenhouse transplant system, corrugated plastic shelters for seed germination and plant development, nursery techniques and handling of nursery stock.

The indigenous hardwood forest is an important component of the landscape and contributor to the life style in the southern half of the province. Many of the species provide valuable products under the right growing conditions. Studies therefore deal with the following: the natural regeneration of yellow birch and maple and the development of these stands particularly for the production of quality hardwoods; improvement of maple sap production by soil fertilization; methods of site preparation and establishment of hybrid poplar, oak, walnut, black locust, ash, black alder and other species on abandoned farm uplands; and rehabilitation of lowland sites with high-quality fast-growing silver maple, Jackii poplar, red ash and European alder selections.

Similarly, the natural spruce-fir-aspen forest of northern Ontario poses many challenges to improve forest conditions. Studies deal with drainage and fertilization of a black spruce swamp, the interaction of soil moisture nutrients and density of black spruce plantations, productivity and nutrient cycling in spruce forest ecosystems, the release of balsam fir by herbicide spraying and thinning, root decay in balsam fir, and the quality and variability of natural aspen regeneration.

An important new development is a program of correlation between the Ontario physiographic site classification developed by Ontario Forest Research Centre during the past 35 years and the Canadian system of soil classification. This was greatly facilitated by the establishment by Agriculture Canada of a forest soils position within the Ontario Institute of Pedology at Guelph.

Long-term studies on growth and yield of red pine plantations have resulted in preliminary tables. Similar studies on hardwoods in southern Ontario have been expanded and attempts made to relate growth to stand and soil parameters. A first-stage Ontario Wood Supply and Forest Productivity (OWOSFOP) model was developed in collaboration with Timber Sales Branch.

More detailed information on staffing, organization, programs and publications is available in Forest Research 78, an annual overview of activities of the Ontario Forest Research Centre.

Silviculture

Tree Seed Program

The inventory of forest tree seed in storage at the Ontario Tree Seed Plant, Angus, as of June 1, 1978, was 5,551,000,000 viable seeds of 92 species, weighing 26,700 kg (59,900 pounds) and valued at approximately $1,000,000.

The year 1978 was a good crop year for many of the species used in the reforestation program.

1978 Seed Crop by Species	Hectolitres Collected
White Pine	116
Red Pine	576
Jack Pine	20,375
White Cedar	198
White Ash	130
Silver Maple	103
Basswood	161
Black Locust	75
Black Walnut	1,723
Other Species	278
Total	23,735 (65,271 bushels)

Seed Distribution

A total of 2,201,450,000 viable seeds was used to carry out 193 regeneration projects in the Province during 1978, an increase of 563,207,000 viable seeds or 34 per cent over the 1977 program. This seed was used in four main programs

Nursery stock production (bare root)	430,437,000
Container stock	17,596,000
Direct Seeding	1,736,895,000
Research and Miscellaneous	16,522,000
Total Viable Seed	2,201,450,000

Plant Stock Distribution

Bare Root Nursery Stock	
conifers	49,170,856
hardwoods	3,757,269
Total	52,928,125
Container Stock	5,487,210
Grand Total	58,415,335
Production Targets seeded	71,197,000

Classification of Cutover Forest Land, 1978-9

Areas in Hectares (Acres)

Cutting Method	Available For Regeneration Treatment			Natural Regeneration Without Treatment			Not Available For Regeneration Treatment			Total		
	Crown	Patent	Total	Crown	Patent	Total	Crown	Patent	Total	Crown	Patent	Total
Clear Cut	69,706 (172,247)	5,812 (14,363)	75,518 (186,610)	32,342 (79,918)	3,558 (8,793)	35,900 (88,711)	27,908 (68,961)	2,055 (5,079)	29,963 (74,040)	129,956 (321,126)	11,425 (28,235)	141,381 (349,361)
Selection Cut	— —	— —	— —	10,772 (26,619)	10,394 (25,683)	21,166 (52,302)	— —	— —	— —	10,772 (26,619)	10,394 (25,683)	21,166 (52,302)
Partial Cut	— —	— —	— —	— —	— —	— —	24,931 (61,605)	7,520 (18,582)	32,451 (80,187)	24,931 (61,605)	7,520 (18,582)	32,451 (80,187)
Total	69,706 (172,247)	5,812 (14,363)	75,518 (186,610)	43,114 (106,537)	13,952 (34,476)	57,066 (141,013)	52,839 (130,566)	9,575 (23,661)	62,414 (154,227)	165,659 (409,350)	29,339 (72,500)	194,998 (481,850)

Summary of Silvicultural Operations, 1978-9

Areas in Hectares (Acres)

REGENERATION	Crown Land	Agreement Forests	W.I.A.	Sub-Total	Other Patent Lands	Total
Planting Nursery Stock	18,529 (45,785)	359 (887)	4,100 (10,132)	22,988 (56,804)	2,201 (5,438)	25,189 (62,242)
Planting Container Stock	2,280 (5,633)	52 (129)	28 (69)	2,360 (5,831)	— —	2,360 (5,831)
Seeding	23,548 (58,189)	6 (15)	— —	23,554 (58,204)	28 (70)	23,582 (58,274)
Scarification	4,013 (9,917)	4 (10)	— —	4,017 (9,927)	— —	4,017 (9,927)
Strip Cutting	2,580 (6,376)	— —	— —	2,580 (6,376)	— —	2,580 (6,376)
Seed Tree Cutting	6,325 (15,630)	4 (11)	— —	6,329 (15,641)	— —	6,329 (15,641)
Shelterwood Cutting	10,669 (26,364)	158 (390)	157 (388)	10,984 (27,142)	87 (215)	11,071 (27,357)
Clear Cutting	2,771 (6,847)	145 (359)	— —	2,916 (7,206)	121 (300)	3,037 (7,506)
Total	70,715 (174,741)	728 (1,801)	4,285 (10,589)	75,728 (187,131)	2,437 (6,023)	78,165 (193,154)
RE-TREATMENT for REGENERATION	3,435 (8,487)	91 (224)	820 (2,027)	4,346 (10,738)	— —	4,346 (10,738)
TENDING						
Hand Cleaning	4,855 (11,998)	660 (1,630)	357 (881)	5,872 (14,509)	— —	5,872 (14,509)
Herbicide Spraying	16,955 (41,896)	459 (1,135)	1,249 (3,087)	18,663 (46,118)	2,050 (5,065)	20,713 (51,183)
Thinning Improvement Cuts	12,853 (31,761)	1,936 (4,785)	4,160 (10,280)	18,949 (46,826)	475 (1,174)	19,424 (48,000)
Pruning	661 (1,633)	459 (1,133)	443 (1,096)	1,563 (3,862)	— —	1,563 (3,862)
Fertilization Drainage	188 (464)	484 (1,197)	25 (63)	697 (1,724)	— —	697 (1,724)
Total	35,512 (87,752)	3,998 (9,880)	6,234 (15,407)	45,744 (113,039)	2,525 (6,239)	48,269 (119,278)
SITE PREPARATION	42,834 (105,846)	578 (1,428)	1,274 (3,147)	44,686 (110,421)	4 (10)	44,690 (110,431)
MARKING	50,243 (124,153)	3,162 (7,814)	5,710 (14,111)	59,115 (146,078)	5,144 (12,711)	64,259 (158,789)
TOTAL AREA TREATED	202,739 (500,979)	8,557 (21,147)	18,323 (45,281)	229,619 (567,407)	10,110 (24,983)	239,729 (592,390)

Tree Improvement

All seed orchards and seed production areas are currently being evaluated for their ability to produce the quantities of genetically superior seed required to fill the needs set out in the Forest Production Policy. Some areas will be deleted, others expanded. It is anticipated that over the next five years the seed production areas will increase substantially; the clonal seed orchards will expand, especially in white pine and white spruce; and seedling seed orchards will be established for species such as black spruce and jack pine. Due to the minimal genetic variation in red pine, no work is currently under way for this species.

	Black spruce	**White spruce**	**White pine**	**Jack pine**	**Red pine**	**Other Species**	**TOTAL**
Seed collection area in hectares (acres)				approx. 6,500 (16,000)			
Seed production area in hectares (acres)	51 (125)	124 (305)	12 (30)	10 (25)	73 (180)	22.5 (55)	292.5 (720)
Seed orchard area in hectares (acres)	14 (35)	18 (45)	12 (30)	— —	— —	3 (7)	47 (117)
No. of plus trees selected	157	180	52	—	—	—	389
No. of scions grafted	4,930	3,995	1,516	—	—	—	10,441
No. of grafted stock outplanted	3,309	3,010	1,473	—	—	—	7,792

Advisory Services

Private Lands

The Woodlands Improvement Act	**Agreements**	**Areas in Hectares (Acres)**
New Agreements Activated 1978-79	746	15,548 (38,419)
Agreements in Effect March 31, 1979	6,935	127,413 (314,843)
Number of Trees Planted	7,736,775	

These operations are carried out on private land under The Woodlands Improvement Act agreements. The acreage treated is an integral part of forest production targets, particularly in southern Ontario where there is no significant area of Crown land.

Agreement Forests

Areas in Hectares (Acres)

Agreement Holders	**Added 1978-9**	**Released 1978-9**	**Total**
1 Government of Canada			1,429 (3,532)
23 Conservation Authorities	129 (318)		38,275 (94,580)
19 Counties	173 (428)		58,899 (145,543)
10 Townships			1,226 (3,029)
6 Regional Municipalities	356 (880)		8,671 (21,425)
59 Totals	658 (1,626)		108,500 (268,109)

The agencies reported above have forest management agreements with the Minister under The Forestry Act. The agencies' forests are an integral part of forest production targets, of particular importance in districts with no significant Crown land areas.

Pest Control

The spruce budworm continued as the most serious forest pest problem in 1978 with the outbreak expanding to a gross area of about 15 million ha (37 million acres). The majority of the infestation is in the Northern Region, but portions of the Northwestern, North Central and Northeastern Regions are also seriously infested. The Ministry conducted a small spraying program to protect high value forests in Kirkland Lake, Wawa and Hearst Districts. A total of 750 ha (1,880 acres) was sprayed aerially, using two chemical insecticides (Matacil and Orthene) and two bacterial insecticides (Thuricide and Novobac).

The recent outbreak of forest tent caterpillar persisted in 1978. Several provincial parks (Grundy, Six Mile and Mikisew), the Frost Centre, and WIA and Agreement forests in the Owen Sound District were sprayed aerially, using Thuricide to preserve the value of public recreation areas and reduce the incidence of maple decline. The spraying programs covered a total of 1,150 ha (2,890 acres).

Maple decline appeared as a serious problem in Owen Sound and Parry Sound Districts with the discovery of small stands of dead and dying maple over a gross area of 17,000 ha (43,000 acres). The cause of this decline is unclear at present, but defoliation of the trees by forest tent caterpillar appears to be a primary causal factor.

An additional 750 ha (1,870 acres) were sprayed aerially with Orthene to prevent serious defoliation by the oak leaf shredder. Spraying was confined to two county forests and one provincial tree nursery in Huronia District.

A number of other minor pest problems, i.e., white pine weevil, pine and spruce sawflies, Fomes root disease and rodents required small-scale control programs throughout southern Ontario. In total, 4,038 ha (10,095 acres) were treated for insect, disease and rodent problems in 1978.

Timber Sales Branch

The major responsibilities of Timber Sales Branch are the rational management of Ontario's Crown land forests and the orderly disposition of the Province's Crown timber resource.

Authority under the statute and the regulations of The Crown Timber Act allows the Branch to effect these responsibilities. They are accomplished through the continuous inventory of the forest resource, the review and approval of all Crown, company, and Agreement forest management plans, the allocation of the Province's Crown timber resource to the forest industry by various statutory methods, the licensing of all forest industry or timber-using mills, the measurement or scaling of the harvested volume of Crown timber, and the continual monitoring of various factors affecting the performance of Ontario's forest industry.

Forest Resources Inventory

The Forest Resources Inventory Section supervised the tendering, quality checking, and indexing of 168,300 km^2 (65,000 square miles) of aerial photography of the Province. Some 72,500 km^2 (28,000 square miles) of this photography occurred in northern Ontario, specifically in the northern half of the Ministry's Cochrane administrative district and extending along the Moose River to James Bay through the Moosonee administrative district. Another northern Ontario area which was photographed was centered on the Kirkland Lake administrative district. All of this photography was carried out at the conventional scale of 1:15,840.

Another 95,800 km^2 (37,000 square miles) of aerial photography was completed through an accelerated program for southern Ontario. Three Ministry administrative regions, Eastern, Central and Southwestern were photographed during 1978 at the new metric scale of 1:10,000, completing the second cycle of the Province's aerial photography.

In addition to the aerial photography, sampling surveys of forest stands were conducted by field parties on almost 9,600 km^2 (3,700 square miles) in the Ministry's Algonquin Region which included all of Algonquin Park. Aerial photograph interpretation, along with the identification of forest stand types in this region, were completed and checked.

Further, more than 31,000 km^2 (12,000 square miles) were covered by checking of interpretation work performed by contract outside the Ministry. These areas were under Crown timber licence to Ontario-Minnesota Pulp and Paper Co. Ltd., Domtar Inc., Great Lakes Paper Co. Ltd, Kimberly-Clark of Canada Ltd., and Reed Ltd.

Checking and project monitoring were also carried out on the forest resources inventory interpretive work of private sector consultants on the Crown land area under the Memorandum of Understanding between the Ministry and Reed Ltd. in northwestern Ontario.

The forest stand inventory data are compiled for computer tabulation. More than 38,850 km^2 (15,000 square miles) of new forest inventory data were stored and report ledgers were produced. As well, the inventories of several Crown forest management units in Northwestern Region and Manitoulin Island were updated.

The photographic darkrooms associated with the aerial photograph work continued to serve the Ministry's main office and field offices alike, as well as the public in general.

Management Plans

Forest management plans provide the broad framework within which forest operations are conducted. More detailed operating plans for shorter time periods identify the Crown timber stands to be harvested, regenerated and tended, and the roads and other improvements required in Crown, Company, and Agreement Forest management units. During the 1978-9 fiscal year, 206,500 ha (510,300 acres) of operational cruise data were processed by computer as supplied by the Ministry's forestry field staff.

Status of Management Plans, March 31, 1979

Areas in Square Kilometers (Square Miles)	**Forest Management Units**					
	Crown		**Company**		**Agreement**	
	No.	**Area**	**No.**	**Area**	**No.**	**Area**
Approved Standard Plans	65	186,733 (72,098)	2	35,136 (13,566)	37	759 (293)
Plans Submitted For Approval	—	—	3	22,528 (8,698)	2	122 (47)
Plans Being Prepared and/or Revised	14	67,461 (26,047)	8	76,977 (29,721)	20	197 (76)
New Inventory Required	3	29,427 (11,362)	4	64,708 (24,984)	—	—
Inactive and/or Inaccessible. Not Under Plans	6	50,199 (19,382)				
Total	88	333,820 (128,889)	17	199,349 (76,969)	59	1,078 (416)

Timber Allocation

The Crown timber resource is allocated to the Province's forest industry in accordance with forest management principles and industrial requirements. Crown timber harvesting licences provide the Province's forest industry with the legislative authority to harvest Crown timber on an annual, allowable-harvest basis. The licences take several forms and are specific as to geographic area, tree species, volumes, stumpage payments and other charges, and various harvest control measures.

As of March 31, 1979, there were 478 active timber licences in the Province covering an area of 239,667 km^2 (92,536 square miles). During the course of the fiscal year, 170 new or renewed Order-in-Council timber licences were drafted, processed and issued, and an additional 16 tendered bid sales were conducted in conjunction with the respective field office.

Wood Measurement

Measurement, or scaling, determines the volume of timber harvested from Crown lands and Agreement Forests. It is the basis for the determination of public revenue and forest production statistics related to the forest industry.

Only licensed scalers, approved by the Ministry, may be employed to measure Crown timber for Ministry purposes. These scalers are required to attend standardized scaling refresher courses on a regular basis so that they are kept fully versed in the latest measuring techniques and to ensure that high, uniform scaling standards are maintained.

Wood measurement practices in Ontario are under constant review, and new methods are continually explored to ensure that scaling methods keep abreast of the latest harvesting techniques.

During 1978-9, 1.637 million m^3 (5.78 million Cunits) were measured as being harvested from Crown land in Ontario. This timber was valued at $35.9 million at the time of measurement. As of July 1, 1978, the Ministry implemented the recommendations of the Timber Revenue Task Force Report (1975) and introduced the concept of indexed Crown timber dues operationally.

Since that time, the Crown timber dues on Order-in-Council licences have been charged quarterly, reflecting the movement of forest product prices.

Late in the fiscal year and together with the Ontario Ministry of Industry and Tourism, the Branch sponsored and organized a successful hardwood saw mill improvement seminar to achieve higher and better utilization of the scarce, high-quality hardwood resource. The proceedings of this seminar are being published and will be distributed for the benefit of all hardwood saw millers in the Province.

Forest Industry Development

This Section is concerned with the growth and development of the various components of the Province's forest industry. It monitors the demand for, and the supply of, timber products and the pattern of trade in these commodities, and it analyzes resource taxation and pricing. The Section assists in industrial expansion and regional development through industrial liaison, policy development and economic analyses.

Forest industry mills are licensed to operate with respect to Crown and private timber supplies in a specific locality. During 1978-9, 836 such mills were licensed to process timber in the Province. These mills produced a record 3.99 million m^3 (1.69 billion feet board measure) of lumber in response to the high demand in the housing and remodeling industries. Pulp and paper product markets became bouyant during the latter part of 1978 and so continued into 1979.

One of the year's highlights included the signing on December 8, 1978, of the forest management subsidiary agreement to the Canada-Ontario General Development Agreement with the Government of Canada, Department of Regional Economic Expansion. This agreement covers $71.5 million worth of projects over five years to be cost-shared and to include forest access roads, silviculture camps, tree nursery expansions, soil surveys, and research and development work.

An active role is also being maintained in the Province's program of modernization and improvement of the pulp and paper industry through advice to the Ministry of Industry and Tourism.

Mineral Resources Branch

The prime objective of the Branch is to assure the orderly development and optimum use of provincial mineral resources in line with the Ministry's policy of broadening the base of mineral development and processing in Ontario. The most important function of the Branch is to provide the Minister of Natural Resources with in-depth researched information and mineral policy options, as well as to ensure equitable mining tax assessments. Major areas of responsibility for the Branch are as follows:

(a) Development and administration of mineral resource policies;

(b) Analysis of the effectiveness of present public policies in various jurisdictions in respect of mineral resource development;

(c) In-depth world-wide mineral commodity studies on each mineral element in provincial mineral reserves, with priorities set for nickel, copper, zinc, iron ore, precious metals, uranium and structural materials;

(d) Administration of The Mining Tax Act, The Pits and Quarries Control Act and certain parts of The Mining Act;

(e) In-depth analysis of the existing tax systems to develop a more effective mineral taxation policy;

(f) Economic studies of metal and mineral markets and factors affecting Ontario's mineral output;

(g) Federal-Provincial liaison on mineral resources problems;

(h) Determination of an inventory of the Province's mineral resources, commodity by commodity, and commercially viable ore reserves;

(i) Continuing analysis of the mineral reserves position against present and projected world supply and demand for minerals;

(j) In-depth studies of mining and exploration company decision-making processes;

(k) Preparation of plans to stimulate exploration for, and development of, mineral resources in Ontario;

(l) Studies on economic behaviour of multi-national mineral resources companies;

(m) Co-ordination of external research studies to evaluate junior and senior mine financing aspects;

(n) Development of computer models to assess the impact of taxation and environmental controls on the Ontario mining industry; and

(o) Development of a computer data base to store, retrieve and analyze the Census of Mines, Quarries and Sand Pits; Survey of Mining Operations; and Survey of Exploration Companies.

Metallic Minerals

The objective of the Metallic Minerals Section is to provide metallic mineral policy options on a commodity or topical basis. This requires the Section:

(a) To monitor metal market trends as well as technological progress in the mineral sector; and

(b) To monitor policy developments in other jurisdictions and other policy fields with respect to their anticipated impact on Ontario metal mining and processing. During the year the bulk of analytical studies which developed the tools for a quantitative analysis of such impacts were completed and the last ones initiated.

The discussion paper, entitled "The Ontario Metal Mining Industry Present and Future", was re-issued. It is still a fact of life that the health of the Ontario mineral sector depends largely on the health of the economies of the industrialized nations such as the United States, the EEC and Japan and, as was demonstrated in Policy Background Paper No. 5, it depends critically upon often intractible domestic policy programs.

On a commodity basis, a study, entitled "Towards a Nickel Policy for the Province of Ontario", was published as Policy Background Paper No. 4.

This is the first compendium on the nickel industry anywhere, and since publication the projections advanced in the study have been largely borne out by events.

A paper on the role of the zinc industry of Ontario in a global perspective was presented at the Plenary Session of the 11th Commonwealth Mining and Metallurgical Congress in Hong Kong in May, 1978. This paper was based upon the previous year's zinc commodity study. Since then a similar paper with updated material was presented at a meeting of the Bathurst, New Brunswick, Chamber of Commerce.

Mineral Policy Background Paper No. 5, "Investment Effects on the Mineral Industry of Tax and Environmental Policy Changes: A simulation Model," was completed and published. This paper quantified the investment impact of past governmental actions in the area of taxation and environmental policy on the Ontario and the Canadian mineral industry and provides the tools to quantitatively anticipate further policy changes in these policy fields.

Policy Background Paper No. 6, "Factor Substitution and Biased Technical Change in the Canadian Mining Industry", Policy Background Paper No. 7, "The Platinum Group Metals - Ontario and the World", Policy Background Paper No. 8, "World Mineral Markets: An Econometric and Simulation Analysis," and Policy Background Paper No. 9, "Guide to Legislation Affecting Mining in Ontario", were completed and are to be issued during the summer of 1979.

A monograph (entitled "Does Resource Conservation Pay?"), which was directed at the issue of alleged mineral resource scarcities on a world-wide basis, was accepted by the International Institute for Economic Research and published in the summer of 1978.

The mineral inventory work carried out in co-operation with Geological Survey of Ontario staff, which forms an important part of the data base for analysis and formulation of policy options for the Government of Ontario, continued; the mineral inventories of uranium and zinc are under constant review, and the nickel inventory will be completed in 1979.

Work on environmental problems of the mining industry is mushrooming. The major issues here, with which policy in the minerals and in other fields still has to come to grips, are as follows:

SO_2 emissions, the acid rain controversy, the handling of tailings disposal problems, and the change in silica standards. Not all of these issues are being dealt with by the Ministry of Natural Resources as the lead Ministry; all of them are of great technical complexity; and all of them are of potentially deadly impact upon the Ontario metal mineral sector.

Consultant's reports on the changing structure of mine financing and of junior mine financing were published in 1978. Involvement in Onakawana is increasing. Two mine hazard land studies have been completed and are being reviewed. Work on a new Mining Lands Act is progressing.

Liaison with organs of the Federal Government, Provincial Government and some foreign jurisdictions, as well as with mining company representatives, continued on matters pertaining to Ontario mineral policy and mineral industry matters of mutual concern.

As required the Section undertakes detailed analysis and recommendations of alternative solutions for any of the problems that affect the metallic mineral sector of the economy as they assume importance in the eye of the public, the industry or this Ministry.

A major new responsibility for the coming years will be the more effective dissemination of the results of the analytical work carried on in the Section to other government agencies and the general public to increase the understanding of the complexity of mineral sector problems.

Industrial Minerals

The Industrial Minerals Section is functionally responsible for all the activities associated with administration of The Pits and Quarries Control Act and for development of mineral policy options for the Government concerning the extraction and use of non-metallic minerals and structural materials.

The Section's function in administration of The Pits and Quarries Control Act involves a continuous consultation and guidance provided to the Ministry's field offices which, through their mineral resources supervisors and quarry inspectors, are responsible for implementing the requirements of the Act. Moreover, the Section is directly responsible for processing pit and quarry applications from the Sudbury and Sault Ste. Marie areas in northern Ontario.

The policy development function is currently being implemented on a progressive basis to deal with each non-metallic mineral and structural material on the basis of continuing studies of supply and demand for these commodities and analyses of draft official municipal plans, implementing the processes outlined as major responsibilities for the Branch.

In addition, the Section maintains liaison with, and provides its expertize to, producers and consumers, the general public, Regions, Districts and other Branches of the Ministry of Natural Resources, other Ontario Ministries and governments at all levels.

Since the establishment of the Industrial Minerals Section in 1973, the following major mineral aggregate studies were contracted out to consultants and carried out to provide input for the development of policy options:

1. Mineral Aggregate Study of Central Ontario Planning Region;
2. Mineral Aggregate Study of Part of the Eastern Ontario Region;
3. Mineral Aggregate Study of Southwestern Ontario Planning Region;
4. Mineral Aggregate Study of the Sudbury Area; and
5. Mineral Aggregate Study of the Thunder Bay Area.

A major focus of activity in 1976 and 1977 was the Section's involvement in the Ontario Mineral Aggregate Working Party which was appointed in December, 1975, by the Ministry to investigate the problems of the aggregate industry in Ontario. The working party was comprised of people from government and other groups most concerned with the problems associated with pit and quarry operations.

In January, 1977, the working party presented its report, "A Policy For Mineral Aggregate Resources Management in Ontario," to the Cabinet. It offered 64 recommendations on how the aggregate industry problems could be resolved. As a direct result of this report, the Section is now involved in writing a new Aggregates Act to regulate pit and quarry operations in Ontario.

In 1978, the Section initiated and prepared the terms of reference for a bulk transportation study of mineral aggregates which has been contracted out to consultants. The study will complement the previous aggregate studies and is designed to provide essential input into a planning process for the transportation of aggregates from more remote areas to meet future expansions of demand.

In addition, the Section staff participated in a study on abandoned pits and quarries, conducted jointly with the Regional Municipality of Waterloo through the University of Waterloo, and co-ordinated a study of pit and quarry rehabilitation in Ontario connected with the University of Guelph.

Also, an in-house research and a study of short-term demand for mineral aggregate in Central Ontario Planning Region has been undertaken by the Section; it is aimed at developing an economic model for forecasting demand for mineral aggregate on a Regional Municipality and County level. The Section has also undertaken an in-house research on the extraction and rehabilitation of pits in Metropolitan Toronto.

Mineral Statistics

The Mineral Statistics Section is responsible for the following functions:

1. Economic and statistical research as an input to the development of mineral policy options;
2. Development and maintenance of an economic and mineral commodity data base;
3. Annual Survey of mining operations, mills/concentrators, smelters/refineries;
4. Annual census of mines, quarries and sand pits;
5. Collection and analysis of national and international data on all mineral commodities, prices, markets, consumption, imports and exports;
6. Publication of the Statistical Report on the Mineral Industry of Ontario;
7. Publication of the biennual Ontario Mineral Review;
8. Consulting services in the field of mineral statistics to other branches of the Ministry, other Ministries and the interested public; and
9. Administration of Part X - Refinery Provisions of The Mining Act.

The Ontario Mineral Review, 1976-1977, and The Statistical Report, 1974, were published in 1978. To improve the immediacy of the Statistical Report, the combined data for 1975, 1976, 1977 and 1978 will be published in 1979.

The Mineral Statistics Section has been reorganized to meet the following main objectives:

1. Develop a user-oriented computerized mineral data base;
2. Provide the professionals and administrators in the Mineral Resources Group and the Regions with more direct access to the mineral data base (normally without assistance from the Mineral Statistics Section while, at the same time, maintaining the confidentiality of company data by using internally programmed tests); and
3. Increase the input of world mineral statistics by upgrading the level of data management.

Mining Tax Assessment

The Mining Tax Assessment Section is supervised by the mine assessor who has six assistant mine assessors and one contract assistant mine assessor as his staff. The assistant mine assessors reconcile the returns filed with the taxpayers' accounting records and prepare draft assessments for the mine assessor.

Mining tax returns received in 1978 indicated liabilities under The Mining Tax Act of $22,308,494.

During the 1978 fiscal year, 53 assessments were issued. The assessed taxes amounted to $17,842,591.

Ontario Geological Survey

The Ontario Geological Survey provides information on the geology and mineral resources of Ontario to encourage industrial exploration, to provide a basis for land-use planning, and to aid in the development of non-renewable resource policies.

Geological, geophysical and geochemical surveys identify favorable locations for mineral and aggregate deposits and provide increased knowledge and understanding of the geological history of Ontario. Data on mineral deposits are compiled, and areas having significant potential identified. Educational programs and published reports and maps are made available to the public. Additional scientific contributions are made by presenting papers and leading field trips at geoscience conventions.

The Ontario Geological Survey administers the Mineral Exploration Assistance Program (MEAP) whereby the Government reimburses an individual or company one-third of the cost of an approved exploration expenditure (maximum $100,000) in any of six designated areas.

In October, 1978, the Ontario Geological Survey participated in the planning and organization of a rarely held joint conference of eleven geological organizations including the Geological Association of Canada and the Geological Society of America. Held at Toronto, this conference attracted nearly 5,000 registrants. Ontario Geological Survey involvement consisted of providing leaders or co-leaders for 12 of the 25 field trips offered, editing and preparing for publication the 360-page Field Trips Guidebook, chairing several technical sessions, and presenting a number of scientific papers to the conference.

On March 26 to 28, 1979, the first Geoscience Research Seminar was held in Toronto to hear the findings of 23 provincially-funded university research projects completed in the 1978-9 fiscal year. Grants totalling over $400,000 were awarded to 10 universities under the Ontario Geoscience Research Grant Program.

Precambrian Geology

In 1978 a total of 23 field crews conducted Precambrian bedrock geological surveys distributed throughout the Province from Red Lake to Renfrew. Surveyed areas ranged from 185 km² to 7,000 km² (70 to 2,700 square miles) depending upon the detail and scale of the survey, and in total 24 areas were examined. Of these, 20 projects, comprising the ongoing survey projects, covered about 2,900 km² (1,100 square miles) at a detailed scale (1:12,000 to 1:31,680) and about the same total 2,900 km² at reconnaissance scale (1:50,000 to 1:126,720).

In addition two projects supported by the Ministry of Northern Affairs, and two projects funded jointly by the Ministry of Treasury and Economics, and the federal Department of Regional Economic Expansion covered an additional 422 km² (163 square miles) in detail and 7,700 km² (2,950 square miles) at reconnaissance scale.

The objectives of these surveys are to produce interpretive maps of the Precambrian bedrock geology, identify geological environments favorable to the occurrence of mineral deposits, and to identify bedrock features which influence mineral concentration and land use to encourage and guide exploration and resource planning.

Base program surveys concentrated on five major geological belts across the Province, and a regional ground reconnaissance follow-up to airborne uranium reconnaissance work in northwestern Ontario.

The two projects supported by the Ministry of Northern Affairs were located in the Larder Lake and Cochrane areas, and the two projects jointly funded by the Ministry of Treasury and Economics and Department of Regional Economic Expansion, Canada, were focussed on the Renfrew area.

Base program projects undertaken in 1978-9 represent components of long-term programs in five high mineral potential belts. These projects included: (1) surveys in the Red Lake, Birch Lake, and Bamaji Lake areas of the Uchi belt; (2) surveys in the Zarn Lake and Howard Falls areas and a special study completed in the Crow Lake-Savant Lake area of the Wabigoon belt; (3) surveys in the Hemlo, Missanabie, Batchawana and Swayze areas; regional studies of radioactive diatreme structures; and studies of the Kirkland Lake-Timmins regional stratigraphy and mineral deposits, all in the Abitibi-Wawa belt; (4) surveys in the Lake Wanapitei and Cobalt areas, and a special study of volcanic rocks associated with uranium bearing rocks north of Lake Huron, in the Southern Province; and (5) surveys in the Long Lake and Harvey Township areas of the southern Grenville Province.

A helicopter supported survey in the Burntbush-Detour Lake area encompassing the Amoco gold discovery, and a survey of potential uranium-gold bearing strata in the Larder Lake area, were completed for the Ministry of Northern Affairs.

In the eastern Grenville Province, a regional mapping project covering much of Renfrew County, and a detailed survey in the area southwest of Dacre, were completed for the Ontario Ministry of Treasury and Economics and the Canada Department of Regional Economic Expansion.

In support of the West Patricia Land Use Plan, a ground investigation, to evaluate uranium potential and classify mineral deposits, was completed subsequent to airborne uranium reconnaissance surveys under the Federal-Provincial Uranium Reconnaissance Program in northwestern Ontario.

In addition to field operations, geological compilation maps (1:253,490) of the Kenora-Fort Frances and Sioux Lookout-Armstrong areas were completed, and one of the Red Lake-Birch Lake area was in preparation, and scientific papers, talks, and field trips were prepared for industry, scientific, and Ministry groups.

Engineering and Terrain Geology

The Engineering and Terrain Geology Section is responsible for the survey and analysis of all geological materials younger than the Precambrian. These include the sedimentary rocks of Paleozoic and Mesozoic age of the James Bay lowlands and of southern Ontario, together with the great variety of glacial deposits of Quaternary age which cover the entire Province.

Major thrusts in these responsibilities are the stratigraphic mapping of the rocks of these ages and the preparation of an inventory of mineral aggregates throughout the Province. An important role is to provide information to, and liaise with, municipalities for aggregate resource planning.

Nine Quaternary geology field parties were active during 1978. Several areas in southwestern and southcentral Ontario, Muskoka and Renfrew Countries, and the Englehart-Kirkland Lake region were mapped. A major drilling and field mapping program was implemented in the Smoky Falls region of the James Bay lowlands to investigate the Mesozoic geology, lignite, and industrial mineral resources of the area. A study of Paleozoic limestone and dolostone resources of Manitoulin Island, funded by the Ministry of Northern Affairs, began with a preliminary drilling program carried out in the fall of 1978.

Work continued in 1978 on the preparation of aggregate resource inventories for all townships in southern Ontario designated under the Pits and Quarries Control (1971). The engineering terrain evaluation of approximately 370,000 km^2 (143,000 square miles) of northern Ontario, that was begun in 1977 with funding provided by the Ministry of Northern Affairs, was extended to additional areas in 1978.

The Section also continued to supply technical support to a study of the physiography and surficial geology of northwestern Ontario by the Ontario Centre for Remote Sensing.

Geophysics/Geochemistry

Staff scientists of the Geophysics/Geochemistry Section carried out a radiometric survey in northwestern Ontario and a gravity interpretation study of two metavolcanic-metasedimentary belts in 1978.

Geophysical survey crews co-operated with geological survey crews to obtain reconnaissance information by helicopter survey on uranium potential for Ministry land use planning in the West Patricia area of northwestern Ontario.

Geophysical staff also performed an interpretative study of gravity data previously collected for the Birch-Uchi-Confederation Lakes Area and for the Red Lake Area. This study, covering 21,320 km^2 (8,230 square miles), utilized over 5,100 Bouguer values and 2,571 rock densities to obtain spectral analysis and two dimensional modelling for two 'greenstone' belts.

Results of an airborne electromagnetic-magnetic survey of the Red Lake metavolcanic belt, funded by the Ministry of Northern Affairs consisting of 9545 line kilometres (5,930 line miles) of data, were released in September, 1978.

The Section was also responsible for planning reconnaissance airborne gamma-ray spectrometer and regional lake sediment geochemical surveys as part of the Federal-Provincial Uranium Reconnaissance Program. This joint program provides data base information for uranium mineral exploration and for the geological assessment of Ontario's uranium potential.

During 1978, the results of two Federal-Provincial airborne gamma-ray spectrometer surveys were released: in northwestern Ontario, a 35,000 km^2 (13,500 square mile) area covering the North Spirit Lake, and parts of Ooasquia Lake, Stull Lake, and Island Lake, NTS sheets; and in southern Ontario, a 58,000 km^2 (22,400 square mile) area covering the Sudbury, Huntsville, and parts of Tobermory, North Bay, and Lake Simcoe NTS sheets.

Results of a Federal-Provincial regional lake sediment geochemistry survey covering 31,400 km^2 (12,100 square miles) in the Thunder Bay-Schreiber area were released in June, 1978, and resulted in approximately 1,800 claims being staked by the private sector.

Geochronology Laboratory

The Geophysics/Geochemistry Section shares the responsibility for the management of a geochronology program with the Department of Mineralogy and Geology, Royal Ontario Museum. The Jack Satterly Geochronology Laboratory, which was initiated in 1975 by a grant from the Ministry to the Museum, has added a capacity to give a stimulus to the understanding of Precambrian crustal history. This facility is providing absolute radiometric ages (by the zircon-uranium-lead method) necessary for unravelling the geological history of the rocks and related mineral deposits in the Precambrian Shield.

A long-term program of radiometric age investigations is continuing with emphasis on the mineral-rich areas such as the Early Precambrian (2.7 billion years old) metavolcanic belts and, specifically, on stratigraphic correlation problems related to the positioning and timing of ore deposition in these belts. Studies are being conducted in the Kirkland Lake-Timmins, Confederation Lake, and Sturgeon Lake-Vermilion Bay areas.

Mineral Deposits

The Mineral Deposits Section studies deposits of both metallic and nonmetallic minerals, their distribution, geology, reserves and potential. An important role is to provide reserve data and resource potential estimates for use in government planning, particularly for land use, parks and transportation corridors, and as background for studies by the Mineral Resources Branch.

The Section co-operated in the National Uranium Reserves and Resources Appraisal Program and related studies including assembly and computerization of Elliot Lake drill hole data. A provincial study of nickel-copper resources, particularly of the Sudbury area, is continuing.

Other studies included metal distribution maps for silver and base metals; a series of mineral potential maps of the Precambrian Shield to aid in large-scale regional planning; and studies of industrial minerals, including asbestos, silica, and marble deposits. A major study of mineral deposits of the Pembroke-Renfrew area was completed (see Pembroke-Renfrew program) as well as uranium potential charts for southern Ontario and a study of peat deposits.

On a routine basis, many producing mines and exploration sites were visited.

Regional Geological Program

Regional and resident geologists' offices were maintained in the following centres: Kenora, Red Lake, Sioux Lookout, Thunder Bay, Sault Ste. Marie, Sudbury, Timmins, Kirkland Lake, Huntsville, Kemptville, Richmond Hill, and London. Regional and resident geologists provide a consultative service to government, industry and the public on the geology and mineral deposits of the Province.

During the year, visits were conducted on a regular basis to operating mines and prospects, and geoscience data for numerous land-planning functions were provided. A variety of field mapping projects and specific studies were also undertaken.

A library of published and unpublished geoscience information is maintained in each office, including reports of the Mineral Resources Group, reports of other government agencies, and records of exploration activities submitted for assessment work credit.

Mineral Exploration Assistance Program

Government payments under the Mineral Exploration Assistance Program (MEAP) for the fiscal year were $435,467, bringing the total government expenditure since 1971 to $2,983,322. The six designated areas are Eastern Ontario, Red Lake, Atikokan, Geraldton-Beardmore, Kirkland Lake and Cobalt-Gowganda. Open file reports 5114, 5147, 5209, 5230, 5251 and 5272 cover MEAP to March 31, 1979.

Pembroke-Renfrew Program

A four-year mineral exploration incentives program in the Pembroke-Renfrew region was initiated in 1976 with funding from the Ministry of Treasury, Economics and Intergovernmental Affairs. During 1977, a further cost-sharing program was signed with the federal government, Department of Regional and Economic Expansion. This program is designed to renew mineral industry interest in the area by supplying information on basic geology and its relation to the known mineral deposits, and by locating areas of highest potential for each of the commodities likely to be found.

Field work and studies of collected data continued in three projects of the Mineral Deposits Section — industrial mineral potential, base and precious metals potential, and uranium and thorium potential. The main thrust of the 1978 program was in selected studies related to stratigraphy and metallogenesis.

The Precambrian Geology Section completed a 250 km² (96 mi²) detailed geological survey of the Khartum area and a 6,000 km² (2,300 mi²) reconnaissance survey of southern Renfrew County.

Northern Affairs Development Program (NAGS)

In the summer of 1977, the Ontario Geological Survey commenced a three-year Northern Development Program funded by the Ministry of Northern Affairs. The program has three objectives — to stimulate exploration for fossil fuels in Ontario, to stimulate mineral exploration throughout northern Ontario, and to improve the land capability and aggregate potential data base to assist northern community and regional planning.

The 1978-9 program included publication in September, 1978, of 16 photomosaic based maps, the results of an airborne EM survey to stimulate exploration in the Red Lake area.

An aeromagnetic survey was completed in the Marshall-O'Sullivan Lakes Area covering 11,866 line kilometres (7,374 line miles) at 200 metre (1/8 mile) spacing; and approximately 8,000 km² (3,100 square miles) were covered by a multifrequency airborne electromagnetic survey over the southern and eastern parts of the Cretaceons Moose River Basin (Geophysics/Geochemistry Section).

A helicopter supported geological survey of the Burntbush-Detour Lakes area north of Lake Abitibi covered 4,000 km² (1,500 square miles) (Precambrian Geology Section).

Other work included a study of the surface and subsurface geology of the southern portion of the Moose River Basin, quaternary geology mapping in the New Liskeard area, and engineering terrain anaylsis for land capability over 139,000 km² (53,600 square miles) between 49° and 50° north latitude (Engineering and Terrain Geology Section).

Northern Ontario Geological Survey (NOGS)

Commencing in 1978, the Ontario Geological Survey, funded by the Ministry of Northern Affairs, began a six-year program designed to stimulate further mineral exploration and development in northern Ontario. The program includes geological, geophysical, and geochemical surveys; mineral deposit studies; preparation of data series maps; and a reconnaissance survey of engineering characteristics and aggregate capability of northern land-forms. Expenditures during the fiscal year were approximately $750,000.

Kirkland Lake Initiatives Program (KLIP)

Also commencing in 1978 was a special five-year program to improve and otherwise stimulate mineral exploration in the Kirkland Lake area. Funded equally by the Ontario Ministry of Northern Affairs and the Canada Department of Regional and Economic Expansion, the Ontario Geological Survey will manage the program which includes Quaternary field surveys, Precambrian stratigraphic mapping, mineral deposit studies, basal till sampling, airborne geophysical surveys, data map compilation, and a technical evaluation service. Expenditures during the fiscal year were approximately $400,000.

Geoservices

The Geoservices Section provides a support and service function to Ministry geoscientists, management and public.

Geoscience Information Office

This Office organizes and conducts classes of instruction in geology and mineral exploration, answers geological inquiries from the public, and prepares or assists in the production of popular brochures and guide books on the geology of Ontario.

During the year, education courses included one basic course, two field courses, and several field trips. During the summer, half-day geological talks were arranged for most of the Junior Ranger camps.

The following publications were released during the year: an updated "Rocks and Minerals Information", "Geological Highway Map - Southern Ontario", and a revised "Geological Guide to Cyprus Lake Provincial Park". One field trip was conducted for the Toronto '78 Field Trips Guidebook.

Scientific Review Office

This office is responsible for the scientific review, editing, and publication of all geoscience reports and preliminary maps. The following were printed during the year:

Geoscience Reports, Geoscience Studies	15
Open File Reports	26
Miscellaneous Papers, Miscellaneous Publications	14
Colored Maps (cartography by Lands and Waters)	19
Preliminary Maps	445

In addition, 27 reports were in progress and under review, and several hundred illustrations were produced by the drafting unit.

Geoscience Data Centre

The Centre performs tasks related to the gathering, research, compilation, and computer processing of geoscience data on mineral deposits of Ontario; indexes publications released by the Ontario Geological Survey and reports submitted for assesment work credit; and within its means investigates and improves upon existing data handling systems.

A computer-based file containing locational and geological data on 511 uranium deposits in Ontario was created. The previously established file, with data resulting from drilling uranium-bearing formations in the Elliot Lake area, was updated and includes presently 1,010 drill holes. Some 140 source records for marble deposits in southern

Ontario, excluding the Renfrew-Pembroke area, were compiled.

Indexing of Ontario Geology Survey publications, assessment reports, and reports received under the Mineral Exploration Assistance Program continued. The indexed information is stored in the computerized Ontario Index to Geoscience Data which at the end of the year covered more than 10,000 reports and maps.

In addition to retrieving data requested by the user, the capabilities of the index have, amongst others, been applied to produce Miscellaneous Paper 77, "Index to Published Reports and Maps, Division of Mines, 1891 to 1977". It lists, for ease of reference, the publications by document number, author name, and geographic entity.

The Centre participated in the development of a system to store and process chemical analytical data on rock samples collected by OGS staff. Computer programs for data manipulation were written, and file building is scheduled to start later this year.

As part of the five-year Northern Ontario Geological Survey (NOGS) program, funded by the Ministry of Northern Affairs, the Data Centre is involved in a Data Management Project. It includes — (a) increasing the NTS detail referenced in the Ontario Index; (b) preparing a General Index to publications released since 1965; (c) compiling mineral deposit data on gold; and (d) building a computerized mineral deposit index file.

The Assessment Files Research Office maintains for public use a library containing all technical surveys filed for assessment credit or filed in accordance with the Mineral Exploration Assistance Program (MEAP).

An important addition to this depository was made by transferring the mineral deposit files, which are being compiled by the Data Centre, to the Research Office. Also filed and made available for public examination are company prospectuses and summary reports received from the Ontario Securities Commission.

As a follow-up of last year's feasibility study on implementing an integrated province-wide indexing, microfilming, and filing system for industry exploration reports, a detailed design study was started near the end of the year.

Geoscience Laboratories

The Geoscience Laboratories provide scientific support for the programs of the Mineral Resources Group. The service includes assistance to the private sector as well as in-house activities. Fees are charged for outside work to avoid competition with private laboratories.

Analytical Laboratory — The laboratory scientists conduct research on analytical techniques and provide a wide variety of analyses on geological materials. Their work ranges from the determination of major constituents of rocks and ores to the geochemical analysis of soil, rock, water, and vegetation samples for trace elements. The laboratory is equipped with up-to-date analytical equipment including a computerized multi-channel x-ray spectrometer, emission spectrographs, and absorption apparatus.

The laboratory continued to support reference material projects sponsored by CANMET and Canada Centre for Inland Waters. Data for the uranium ore BL-1 (CANMET) and sediments WQB-1 and WQB-2 (CCIW) were submitted for inter laboratory quality control.

Methods development and research continued to be important for meeting program needs. A paper, entitled "Semi-Automated Determination of Antimony in Rocks", was published in Analitica Chimica Acta in October, 1978.

The following new methods were developed over the past year: a rapid method for determining sulfur and carbon using the Leco CS 46 induction furnace; and automated technicon analyzer system for analyzing fluorides; a new x-ray method for cerium and neodymium; an automated soft rock program on the XRF quantometer; and a new bead fusion technique for the rock program.

Mineral Sciences Laboratory — The Group conducts examinations, consultations and projects for the Ontario Geological Survey, the public and mining companies. It also conducts research with respect to mineralogy, petrology, and physical testing. Mineralogical studies involve the use of petrographic and X-ray diffraction techniques.

The laboratory assisted with analytical, mineralogical and physical testing in the following geological projects: Study of Ontario Peat Bogs; Mineral Exploration Incentives Program for Pembroke-Renfrew Region; Alkali Rocks and Carbonatites of Ontario; James Bay Fossil Fuels Exploration Project; Atikokan Gold Study; Manitoulin Island Resource Study; and various clay mineral studies.

Provincial Parks Branch

The number of campers using Ontario Provincial Parks in 1978 was 1,430,751. These campers stayed a total of 3,102,508 nights.

The number of provincial parks in operation increased from 126 to 128 with the addition of Fathom Five Provincial Park, a 9,800 ha (24,216-acre) Natural Environment Provincial Park at Tobermory, and Awenda Provincial Park, a 1,915 ha (5,732-acre) Natural Environment Provincial Park near Penetanguishene. (While available for public use in the summer of 1978 Awenda was not scheduled for official opening until 1979.)

Improvements, particularly to water, sewage, roads and electrical distribution systems, continued to be priority projects throughout the park system.

Visitor Services Interpretive Program

Good progress was made in improving the type of information given in the individual park leaflets. Seventeen leaflets have now been completed. Seven new Audio Visual shows were produced.

Progress continued to be made in the implementation of regional visitor services plans. Greater emphasis was placed on the training of seasonal staff and resulted in improved delivery of programs. Self-use facilities were expanded and improved in keeping with the visitor services plans.

Recreational Land Acquisitions

Work continued on the evaluation of future parkland with emphasis on increased recreational facilities for southern Ontario residents. During the year, 2,064 ha (5,100 acres) were acquired for Outdoor Recreation purposes.

Master Planning

In response to requests from many interested individuals and organizations concerning the official status of master plans for Provincial Parks, an amendment was made to The Provincial Parks Act in June, 1976. The term "master plan" is now defined in the Act. The amendment also authorizes the Minister of Natural Resources to prepare and approve a master plan for any existing or proposed provincial park as well as carry out periodic reviews and make necessary alterations to an approved master plan.

To date 20 master plans have been approved by the Minister, 14 are pending final review and approval, and 30 others range between initial and advanced stages of preparation. Thus approximately half the provincial parks have master plans either completed or under way.

Public participation programs continued for several planning projects such as Kettle Lakes and Greenwater to encourage maximum public involvement in the decision making process.

The five-year review involving a public participation program was initiated for the Algonquin Provincial Park Master Plan.

Winter Parks

During the winter of 1978-9, Sibbald Point Provincial Park, on Lake Simcoe, was the only provincial park providing full services for camping, including electrical outlets, heated washrooms, fuelwood and ploughed roads. Regular fees were charged. At Algonquin Park, the Mew Lake Campground was open for winter camping free of charge, but with limited facilities and no electrical outlets or drinking water.

Other parks — such as Arrowhead, near Huntsville; Pinery, on Lake Huron; Rondeau, on Lake Erie; and Bronte Creek, near Burlington — were open for winter day-use. Facilities included groomed cross-country ski trails, snowmobile trails, outdoor skating, snowshoeing, ice fishing and tobogganing. Regular fees were charged.

Remi Lake, near Kapuskasing, continued to operate a ski tow and offer cross-country skiing and tobogganing.

Many other provincial parks throughout the province offered groomed trails for snowmobiling and cross-country skiing on a day-use basis, and maintained limited facilities such as ploughed parking lots and vault toilets for the convenience of the public. No fees were charged.

A publication, entitled "Winter Outdoors", was issued for the first time to provide a condensed description of recreation opportunities in all provincial parks during the winter season.

Winter Trails

During the 1978-9 winter season, $500,000 was made available through the Winter Trails Recreation Program in the form of grants to assist trail clubs and Conservation Authorities with the grooming and maintenance of more than 12,875 km (8,000 miles) of snowmobile and cross-country ski trails throughout the province.

The Ministry maintained 1,610 km (1,000 miles) of snowmobile trails and cross-country ski trails on Crown land. In addition, many provincial parks offered facilities for these popular activities.

Access Points

Approximately 1,400 access points with parking areas and boat launch ramps were maintained to provide access to lakes and rivers.

Interior Camping, Canoe Routes

During 1978, 93,000 people entered Algonquin, Quetico, Bon Echo and Killarney Provincial Parks for interior canoe camping and hiking.

In 1978 regulations concerning the use of motor-powered boats in Algonquin Provincial Park were amended as part of the implementation of the park's Master Plan. Motor boats will be restricted to 27 lakes as per the following schedule: 16 lakes will have no restrictions on horsepower ratings for motors; on 11 lakes motors not exceeding 10 horsepower will be permitted; and on 12 lakes motors not exceeding six horsepower will be permitted except during July and August.

In total, the Ministry managed 24,140 km (15,000 miles) of canoe routes in provincial parks and on Crown land.

Provincial Parks Policy and Park Classification

A policy for the Provincial Park system was approved by the Government in May, 1978, after considerable review with the Provincial Parks Council and other Ministries of the Government. The policy details a goal and a set of objectives for Provincial Parks, the principles by which the parks will be planned and managed, and a revised park classification scheme. Six distinct park classes are established: Natural Environment, Wilderness, Recreation, Nature Reserve, Waterway and Historical.

More detailed policies for each park class were released in September, 1978, in a manual entitled "Ontario Provincial Parks Planning and Management Policies". These policies provide direction for zoning of environmental, recreation and visitor services management.

Park User Survey

A visitor survey program, initiated in 1974, was continued in 1978 with surveys of day-visitors and campers in 20 parks. The purpose of the program is to obtain information essential to the planning and management of provincial parks and provide an opportunity for public comment. Parks are surveyed on a rotational basis.

Waterways Areas

A waterway identification and evaluation exercise has produced an inventory of the Province's most promising rivers for waterway designation. More detailed investigation of the most highly rated rivers of that group is now under way to determine the costs and benefit of establishing additional waterway provincial parks.

Nature Reserves

Draft frameworks for the systematic identification of provincially significant natural features and environments have been reviewed, and appropriate revisions are under way. These frameworks will be employed to help identify and evaluate potential nature reserves, as well as to measure the extent to which our natural diversity is being protected within the provincial park system.

The Schreiber Channel Provincial Nature Reserve was placed in regulations under The Provincial Parks Act, increasing the number of Provincial Nature Reserve Class parks to twelve. This park contains an extremely significant Precambrian outcrop and fossil site.

Regional Systems Planning

Work continued in 1978 on regional park systems planning. A number of regions have produced preliminary evaluations of existing parks and park reserves and estimates of needs related to protection, recreation, heritage appreciation, and tourism objectives. Production of initial regional park systems plans is scheduled for 1980-1.

Site Planning, Facility Design and Development

Decentralization of the site planning section was completed in October, 1978. Landscape architectural services, formerly provided at Maple, Ontario, are now based at the regional offices. A central unit for special projects has been retained in Toronto.

Provincial Parks Council

The Ontario Provincial Parks Council was established in October, 1974, to advise the Minister on provincial parks issues. The Council's third annual report was submitted to the Minister in July, 1978, outlining deliberation and recommendations on a variety of issues including park policy, mining in parks, tourism, visitor services, Algonquin Provincial Park, Quetico Provincial Park and Lake Superior Provincial Park.

The Council held public hearings during the year in Toronto, Windsor, Killarney and Peterborough and examined a variety of issues including the leasing of parks, reservation system, acid rain, park planning and legislation.

Dr. George Priddle, from the University of Waterloo, continued to serve as Chairman of the 10-member Council. The Council initiated a comprehensive five-year review of the Algonquin Provincial Park Master Plan.

Provincial Parks and Tourism

The Ministries of Natural Resources and Industry and Tourism examined means whereby provincial parks might make a greater contribution to Ontario's tourism industry. Three proposed areas of emphasis were identified in the studies. They included concepts related to park operations, marketing and commercial investments. Detailed proposals will be developed for further consideration by the government.

Wildlife Branch

The objective of the Wildlife Branch is to provide:

A wide variety of wildlife-based outdoor recreational opportunities accessible to, and for the continuous benefit of, the people of Ontario;

A continuous contribution to tourism and its related industries;

An optimum contribution to the economy of Ontario by regulating the commercial utilization of wildlife; and

The protection, conservation and enhancement of the wildlife resources of the Province and their habitats.

Moose Management

A comprehensive moose management policy and plan have been developed in light of continued high demands on a declining moose herd by the public for hunting and viewing.

Attempts to reduce the annual mortality, through hunting season manipulation, closure of seasons for non-residents and increases in non-resident licence fees, have not effectively prevented further deterioration of the herd. After four years, there still are areas where overharvesting by hunters and predators is occurring, and much good moose range remains understocked in consequence. The provincial herd remains at a low level of 80,000, which is about one-half the capacity of the range to sustain.

A controlled moose hunt was carried out in the Larose County Forest, 40 km (25 miles) east of Ottawa. The hunt lasted five days at which time the planned harvest of 20 moose had been reached. This particular hunt demonstrated a method of using controlled hunts for big game in southern Ontario and the acceptability of the methods used to control numbers of hunters. A lottery system was well accepted by the very large number of prospective participants in this hunt.

A second controlled moose hunt on Crown Lands was planned on an experimental basis in the Kapuskasing-Hearst areas (WMU 23) for the fall of 1979. The prime objective of this system of licensing hunters is to define and resolve problems related to allocation of the resource and develop the best procedures for carrying out more highly organized hunts in the future.

The development of standards and guidelines for assessing moose harvests, along with the delineation of wildlife management units, was undertaken.

A 16 mm film, on MNR's moose management entitled "Monarch of the North", was produced. It is available to the public and is suitable for educational use as well as entertainment.

Deer and Bear Management

Proposed deer management policies and programs were tentatively approved by the Minister. Staffing and funding requirements are now being considered.

The number of deer in the forested areas of the northwest fluctuates with winter conditions and predation. In the forested areas south of the French and Mattawa Rivers, deer numbers are declining as a result of hunting, predation, illegal kill, decreasing habitat quality, and unfavorable winter conditions. The proposed deer program, designed to improve conditions wherever possible, may be operational by 1980.

In the agricultural south, deer numbers are increasing, causing highway accidents and interference with agriculture.

Methods are being sought to allow the harvest of deer in agricultural areas.

Two 16 mm films have been produced to provide specific information concerning the proposals embodied in the deer management program and methods by which the public can assist the Ministry in habitat improvement. The films, entitled "Shadows in the Forest" and "Habitat Management for White-tailed Deer in Ontario", are now available through district offices.

Black bear numbers, though difficult to assess, are believed to be generally constant. Hunters take about 4,000 bears per year, and the number of bear hunters is increasing. Bears causing conflict with agricultural activities or public safety are trapped, and relocated whenever feasible or destroyed.

Upland Game and Waterfowl Management

Development of alternatives for new program initiatives in the management of upland game is in progress. Improved population inventories have been developed for selected species. Inventories for pheasant and bobwhite quail have been refined in consultation with field staff responsible for implementation.

A reassessment of raccoon hunting and trapping has resulted in a shortened open season, from October 15 to December 31 of each year. The reduced season is expected to optimize benefits from the raccoon resource which is valuable to both hunters and trappers.

Most populations of small game appear stable. Hungarian partridge, woodcock, showshoe hare, and ruffed grouse should again be abundant in the next hunting season.

Squirrel, European hare, cottontail rabbit, and bobwhite quail populations were lower than normal in some areas in 1978. This is largely attributed to natural fluctuations, and in the case of bobwhite, severe winters. Recoveries in numbers of these species in 1979 is being monitored.

A program to produce a wild breeding population of Canada geese in southern Ontario, started in 1968, has been most successful. Viewing and hunting opportunities continue to increase in association with an estimated population exceeding 20,000 birds. Geese have become over-abundant in some areas along the Toronto waterfront where conflict with other uses of the land has been increasing. Management efforts to reduce the waterfowl population are continuing in co-operation with the Canadian Wildlife Service and a number of other agencies.

Waterfowl banding projects in 1978, to gather important management data for use by Ontario and the United States, will continue in 1979. Ontario is co-operating with the Canadian Wildlife Service and a number of Atlantic and Mississippi Flyway States where the birds are hunted or spend the winter.

In the Hudson-James Bay lowlands, the muskeg was free of snow early in the spring of 1979, and production of Canada and snow geese is expected to be much improved from 1978. In most of southern Ontario, duck production is expected to be good in 1979 due to favorable water levels, also an improvement from 1978.

Waterfowl management policies and programs in Ontario are under review and will be the basis for establishing some form of agreement for management with the Federal Government.

Non-Game Management

Ontario's wildlife program is directed towards the management of all species of wildlife as opposed to the management of only game or commercial wildlife. The non-game and non-commercial components of the program have evolved more slowly than those which have more measurable social and economic results. Concern for non-game wildlife has been demonstrated in the over-all wildlife program of the Province for several decades, initially in connection with park naturalist activities, and later, in the 1970s, within the framework of an endangered species program.

Plans are now under way for the development of comprehensive policies which will incorporate the established endangered species policy and broader policies encompassing all non-game wildlife.

At present, thirteen species or subspecies are designated under The Endangered Species Act. No new additions to the list have been made since August, 1977, but status assessments for various species are being worked on. Of particular interest is the assessment of candidate endangered and threatened plants.

A considerable effort has been made to provide the Committee on the Status of Endangered Wildlife in Canada with status assessments for a number of species and subspecies of reptiles and amphibians. This work will be of benefit to the program when priorities for studies and management need to be assigned.

Nineteen seventy-nine is the third year of a five-year project to reintroduce peregrine falcons to Ontario. Surveys for active bald eagle nests were repeated again this spring on the Lake Erie shoreline, and censuses of the northwestern Ontario population will also continue.

A survey is under way in northwestern Ontario to determine the number of breeding pairs of piping plovers. Surveys of the Kirtland's warbler will continue in 1979 in a small number of areas which may be key habitat for this species.

Ontario Hydro has rerouted a section of the Middleport-to-Milton 500 KV Transmission Corridor which would initially have passed through habitat of the West Virginia white butterfly in the Halton County Forest. Mitigative procedures were implemented along the new alignment to minimize any effects on the adjacent habitat, and the results have been highly successful. In 1978, a five-year study was developed to investigate the impact of different forest thinning regimes on the habitat of the butterfly. The feasibility of wood production in the butterfly's habitat will be assessed on the basis of the study results.

Wildlife Management Areas

Twenty-nine Provincial Wildlife Areas are maintained in southern Ontario to provide wildlife-based recreation on public land, and similar recreation is available on 13 Wildlife Extension Landowner Agreement Areas established by agreements with landowners. Habitat is managed to produce wildlife for viewing and hunting and to protect wildlife populations.

Planning

Many kinds of plans, including recreational, forestry, mining, housing and municipal development plans, have been reviewed to ensure that wildlife interests are an integral part of planning.

An integrated Provincial plan for wildlife has been undertaken. The first objective is to define more precisely than in the past the provincial government's responsibility for wildlife. The next is to determine an over-all wildlife strategy, and then a work plan for Ontario wildlife.

A cost-benefit study of provincial wildlife areas was undertaken as a preliminary part of a systems planning program for these areas. A study of the implications of the use of native birds of prey in falconry was begun.

A proposal for tax reductions for owners of wetlands and habitats of endangered species was provided at the request of the former Ministry of Treasury, Economics and Inter-governmental Affairs for use in the proposed revision of property taxation.

Broad priorities were established for protection of major migratory bird habitats as part of a task undertaken by eastern provinces and the federal government. The mapping of important migratory bird habitats in southern Ontario was initiated and compilation was completed.

Staff continued to participate in studies of proposed large-scale developments which have the potential of affecting wildlife or wildlife habitat.

Wildlife Services

Ontario's Conservation Officers are responsible for the enforcement of The Game and Fish Act and various other Acts administered by the Ministry of Natural Resources. They are also appointed as Fishery Officers under the Fisheries Act of Canada and as Game Officers under the Migratory Birds Convention Act of Canada; they are authorized to enforce those Acts and regulations thereunder on behalf of the Government of Canada.

During the past year, Conservation Officers laid a total of 9,630 informations resulting in 8,365 convictions.

Wildlife Surveys and Records

Records of four years' hunting and non-resident angling licences are maintained as a service to the public. Statistics on hunting, including participation rates, hunter success and harvest, and characteristics of participants, are obtained through mailed questionnaires. This information supplements and corroborates data obtained in the field, and forms the basis for wildlife management planning.

Furbearer Management

The 1977-8 trapping season saw significant increases in the prices received by trappers for the pelts of furbearing animals. The beaver harvest of 147,556 pelts was worth $3.0 million; 433,163 muskrat pelts were marketed for $2.3 million; and 93,178 raccoon pelts were sold for $2.1 million. All together, 14,725 trappers sold pelts valued at close to $11.3 million. Royalties collected on fur totalled $588,552.80.

A comprehensive fur management manual for use by Ministry staff and trappers was in preparation.

The Ministry trap development program has successfully field-tested a new live-trap (a foot-snare device) used to catch coyotes, foxes, raccoons and feral dogs and cats. While the capture rate with the live-trap was comparable to that of traditional traps, serious injury to animals was much less.

Sixteen instructors were trained in co-operation with Georgian College, Barrie, at a Trapper Instructors course held at The Leslie M. Frost Natural Resources Centre at Dorset. These seasoned and knowledgeable graduates conducted 18 Fur Harvest and Fur Management and Conservation courses for trappers in southern Ontario.

Hunter Education

In 1978, the "Hunter Safety" Training program was expanded to include hunting ethics, wildlife management, wildlife identification, bow hunting and hunter-landowner relations, in addition to the traditional topics of firearm safety, safe hunting practices and survival training. The new program name, "Hunter Education", is a more accurate reflection of the new course content.

The Hunter Safety Development Committee has completed a new Hunting Licence Examination paper which will upgrade the Province's examination standards.

During the year, 879 certified Hunter Education Instructors trained 38,500 students, and the Ministry's hunting licence examiners conducted 35,600 hunting licence examinations. The Ministry's courses on Methods of Instruction and Range Procedure Training were attended by 75 program instructors.

Wildlife Research

Research seeks to fill knowledge gaps by investigations of population dynamics, behavior, physiology, reproduction, diseases and parasites, and interactions between selected species and their habitats.

Investigations of mineral nutrition of moose suggested a strong seeking for sodium, and possibly other elements, at natural mineral licks, and for iron and other substances contained in aquatic plants. Moose also seek salt in highway ditches and a high proportion of vehicle-moose collisions occur in late May and early June when moose are seeking salt most actively.

Studies of the ecology of black bears continued at a high level. More than 50 radio-marked bears were contacted daily throughout the summer of 1978, yielding 5,000 locations, which provided valuable information on habitat use. A new expanding collar allowed us to track cubs and one to three-year-old bears, providing more complete coverage than ever before.

Investigation of vector dispersal, part of the rabies research program, continued to provide interesting observations of short- and long-distance movements of red foxes and coyotes. Experiments in the field verified the efficacy of a large-scale baiting strategy, aimed ultimately at distributing rabies vaccine to wild animals.

Other studies included behavior of moose and deer, use of nest boxes by goldeneye and other ducks in northern Ontario, parasites and diseases of black bears, and numbers and reproductive success of polar bears. Publications on the latter subject, and on long-term deer studies, are in preparation.

Resource Development (Native People)

The resource development programs assist the native Indian people of Ontario in the use of renewable natural resources for their economic benefit. The following projects were carried out during the year under the Federal-Provincial Resource Development Agreement.

Fur. This program provides for the placement of Indian trappers on vacant trapline areas. Aerial surveys are conducted and maps showing live beaver colonies are supplied to the trappers. Transportation of supplies, equipment and furs is also provided. Trappers' workshops are held to promote the improvement of trapping techniques and general handling of pelts.

Commercial Fish. Administrative and operational assistance is provided to native people in the Northwestern Region in their commercial fisheries activities.

Sport Fish. Seven lakes were stocked with lake trout and brook trout on the Garden River Reserve to promote sport fisheries in these waters.

Tourism. Four goose camps were operated during the 1978 season by the Indian people along the James Bay and Hudson Bay coasts. Two goose camps were turned over to individuals. Fort Severn Goose Camp was turned over to Mr. Jack Stoney of Fort Severn, and the Attawapiskat Goose Camp was turned over to Mr. Gabriel Spence. The official presentation to Mr. Spence was made by the Lieutenant Governor, The Honourable Pauline McGibbon. Three camps were provided with assistance and supervision by Ministry staff.

Hide Collection. In 1979, successful hunters provided nearly 11,000 moose and deer hides for the native people of Ontario. The continuing success of this program is due to advertisements, hunter contacts made over the years, as well as the award of a "Bush Cap" to hunters who donate moose and deer hides. Presently there are more than 4,000 native people involved in the craft program. It contributes considerably to the native peoples' economy by providing material for handicrafts.

Timber. Assistance was provided to native people in various timber and lumbering operations, and in reforestation and regeneration programs.

Planning. Representatives of Grand Council Treaty areas, No. 3 and No. 9, Union of Ontario Indians, and COR-AID (Central Ontario Regional Amalgamated Indian Development) are members of the Resource Development Committee and assist Ministry and DIAND (Department of Indian Affairs and Northern Development) staff in planning programs of priority for the native people of Ontario as they relate to the renewable resources. Indian Band Councils are also consulted about programs which would prove to be most beneficial to their members.

Game Management. Studies of deer populations, mortality rates and range potential were conducted on Wikwemikong Reserve on Manitoulin Island at the request of the Band Council. The objective of this program is to provide guidance to the band in management of deer on Reserve land. The project is to be completed in 1979.

Northern Policy Development. Negotiations were begun under the Tripartite Agreement (Canada, Ontario and the Chiefs of Ontario) to develop a policy for the management of wild rice, and to recommend a mutually agreeable policy regarding Indian rights to harvest wild rice. A study of the wild rice industry by staff of the University of Guelph was commissioned by ARDA (Agricultural and Rural Development Act) for the Tripartite Wild Rice Working Group.

Staff continue to participate in studies on proposed northern developments which have the potential of affecting wildlife or wildlife habitat.

Fisheries Branch

The objective of Fisheries Branch is to maintain and enhance the fish populations of Ontario as a stable base upon which recreational and economic benefits are provided to the people of this Province.

Fish production potentials of many Ontario lakes have lost their stability during recent decades. General stresses acting on fish populations include excessive exploitation, degradation of habitat and water quality (by land and water based developments and by nutrients and/or contaminants), and side effects of newly introduced or invading species such as smelt and sea lamprey.

Recovery of the former fish production potential of Ontario waters requires a more intensive degree of fisheries management effort throughout the Province. This will include continuing international participation in the Great Lakes Fishery Commission program and an increased fisheries role in water-quality management programs co-ordinated by the International Joint Commission.

The strategy recommended by the federal-provincial Strategic Planning for Ontario Fisheries (SPOF) study was accepted in principle by Cabinet during 1977. This study identified problems affecting Ontario's fish resource and recommended an expanded fisheries program complete with new policies, more staff and additional funding to rectify the problems. Several working groups continued to develop new policies in areas identified by SPOF. Implementation plans have also been developed by SPOF.

Commercial Fishery

The total commercial fish harvest in 1978 was 22.1 million kg (49.1 million pounds), slightly down from 1977. However, strengthening prices raised the total value of the harvest to $15.4 million, up slightly from 1977. As in 1977, baitfish catches were relatively constant, but the total value of the catch increased due to increased prices.

The commercial landings of most species remained comparable to those of the previous year. A notable exception was the harvest of carp in Lake Ontario which declined by 95 per cent because of a closure due to contaminants.

The dominant species in the commercial catch was yellow perch which accounted for 20 per cent of the total landings and 40 per cent of the total value. Most of the perch (88 per cent) came from Lake Erie. As in the past, Lake Erie accounted for more than 70 per cent of the total provincial harvest and approximately 60 per cent of the revenue from commercial fishing.

The Freight Equalization Program continued, under a revised rate schedule, to assist fishermen in remote areas of the Province to meet high freight costs.

Under the federal-provincial Fisheries Industrial Program, a number of projects were carried out in 1977.

Canadian paired trawling was continued in Lake Erie to explore methods of harvesting coarse fish.

A large monofilament-mesh trap net was constructed in Thunder Bay to harvest whitefish. The net was used for further exploration and demonstration of effective impounding gear for lakes in northwestern Ontario.

Fish Culture

The Fish Culture Section is responsible for planning and co-ordinating production of eggs and young fish to be stocked in selected Ontario waters. During the fiscal year, 877 thousand eggs and 6.1 million fish were stocked. Thirty-six per cent of the fish were released into the Great Lakes and their tributaries. All the eggs and the remaining fish were stocked in more than 1,100 inland waters. The eggs stocked included brook trout, lake trout and splake. No pickerel eggs (approximately 7 million in 1977) were stocked due to an egg collection failure.

Approximately 77 per cent of the fish stocked were salmonids — aurora trout (1%), brook trout (21%), lake trout (24%), rainbow trout (15%), splake (8%), coho salmon (3%) and chinook salmon (6%). The remainder were maskinonge (18%), yellow pickerel (1%), smallmouth bass (3%) and largemouth bass (2%).

Maintenance of the fish culture data base continued. Selected field staff began to use the system and to define standard reports and special analyses required by district and regional supervisors, hatchery managers and main office staff to increase the future effectiveness and efficiency of the hatchery program.

Renovation of the main hatchery at Dorion was mainly completed in 1978 and planning for the renovation of Hill Lake Hatchery continued.

The disease monitoring program continued. Two fish culture stations were disinfected to eradicate disease organisms and there was a significant increase in the number of stocks monitored.

An agreement between the Ministry and the University of Guelph permitted the continuation of disease diagnostic services and nutrition studies.

The special projects initiated in 1977 were continued; these included studies on the feasibility of culturing whitefish for the rehabilitation of Lake Simcoe and on techniques for the advanced culture of yellow pickerel.

Fish Habitat Management

The loss of significant portions of fish habitat continues to be a problem. Notwithstanding normal changes during each season, society's activities will constantly stress and degrade fish populations through destruction of habitat. The rehabilitation of lost or degraded habitat is a slow process during which time fish production is very low.

Dams, many in disrepair and abandoned, block migrating fish and limit the production of trout to a level much below the potential. Some dams are bypassed by fishways. With the opening of the fishway on the Lucknow River at Port Albert, the total number of trout, that ascended fishways in 1978 to spawn in the cold, clear upper reaches of Great Lakes streams, reached 8,000.

Other dams are bypassed by trucking fish around them. In 1978, several hundred adult rainbow trout were transported above dams where they spawned successfully.

In addition, 39 adult rainbow trout from Lake Ontario were introduced to the new artificial spawning channel on Cobourg Creek in April 1978. The spawning channel proved successful as fish began spawning soon after their transfer; and in the fall, large numbers of juvenile rainbows were found in the area.

The rehabilitation of fish habitat on Wilmot Creek continued with the installation of half-log structures to provide cover for fish. Monitoring of water quality and related aquatic life also continued and a report describing this work is expected in 1979. Rehabilitation work was initiated on other cold-water tributary streams to the Great Lakes.

The study at Nanticoke continued. By a special arrangement with Ontario Hydro, Stelco and Texaco, the Ministry has undertaken a long-term study of the effects of industrialization on fish and related habitat in the Long Point Bay area of Lake Erie.

The publication of the study conducted with the Ministry of Transportation and Communications on the effects of highway construction on Galt Creek, Ontario, was prepared, as well as an annotated bibliography on the impact of roads on aquatic systems.

The inventory of aquatic habitat in lakes and streams continued. In 1978, 549 lakes (380,000 ha, 940,000 acres) and 479 km (300 miles) of streams were surveyed. A computerized system to store and retrieve this inventory information is being developed. A total of 570 fishing maps have been printed for public use.

Some fish species in certain waters are contaminated with heavy metals, pesticides and other hazardous chemicals. In 1978, approximately 12,000 fish from 270 waters were collected for testing by the Ministry of Environment. This co-operative program will continue in 1979. The objectives include comprehensive reviews of contaminant levels in fish by water body and sufficient advice from health authorities to assist anglers in deciding how much fish to eat at any one time.

Fisheries Policy Development

Fisheries Policy Development Section is responsible for establishing a planning frame work for Ontario fisheries resources and developing policies to manage these resources.

A slide presentation outlining the proposed expansion of the fisheries management program, entitled Strategic Planning for Ontario Fisheries, was completed, and 22 talks using these slides were made to Ministry staff and public groups by Section staff in 1978.

Input is provided to Ministry strategic land use plans, municipal plans, lakeshore development studies and other plans required. This ensures that fisheries concerns are adequately considered during the planning stage of government projects.

A multi-factor model for calculating probable fish yields from lakes was developed and tested, and a manuscript describing its use and project results was prepared.

Data analyses from the joint federal-provincial angler survey of residents and non-residents fishing in Ontario in 1975 continued. A manuscript report describing this study was prepared in 1978 with a publication to follow in 1979.

Administration of the boating restriction regulation program continued. Eleven regulations were processed and submitted to the federal government for approval and enactment under the Canada Shipping Act.

Liaison between Ontario and the federal government for small craft harbour development continued via the Inter-Ministerial Committee on Great Lakes Access.

Fisheries Research

The Fisheries Research Section undertakes or arranges investigations to provide the basic understanding needed for optimum, scientific management of Ontario's fish resources. It carries out relevant research, publishes the results in internationally recognized scientific journals, and makes its specialized expertise available to all levels of the Ministry.

Much of the research is aimed at improving our ability to predict the impact of man's growing use of waters and fish communities. Staff have become increasingly involved in multi-disciplinary co-operative work with scientists from sister ministries, the federal government, international commissions and universities. Two excellent examples are Project Quinte and the Lakeshore Capacity Study.

The Project Quinte study, which involves scientists from both the federal and provincial Environment ministries and Queen's and Guelph Universities, as well as the Ministry's Lake Ontario research staff, reached an important milestone in 1977. Removal of 80 per cent of the phosphorus from local sewage is now an accomplished fact, and the scientific team has completed the comprehensive studies which documented the pre-treatment conditions in the bay. Publication of these baseline studies is expected later this year in a special volume of the Journal of the Fisheries Research Board of Canada. Improvements in water quality are already evident, and work is now on hand to follow the response of the aquatic community and to direct it, so far as possible, towards restoration of attractive and profitable fisheries.

The Lakeshore Capacity Study is intended to provide a reliable factual basis for judging the degree of development which can be allowed around recreational lakes without seriously adverse effects. The fisheries component has developed mathematical models relating fish catches to fishing effort, and fishing effort to numbers of cottages and other forms of angler access to the lake. It has also developed and applied methods to identify and map important areas in these lakes, which are critical to maintaining fish production, and evaluate the impacts on them of such development activities as dredging, filling, weed removal, dock building, or boating. Besides the ongoing field work a summary of relevant literature has just been prepared. Throughout, close links have been maintained with related Ministry of the Environment and Ministry of Housing programs.

Research on survival, growth and reproduction of hybrid trout under field conditions is being continued. In particular, a new backcross strain of splake hybrid has been developed and was planted for the first time in 1979, in substantial numbers in Lake Huron. Comparative tests of the performance of this backcross strain and lake trout in Lake Huron, implemented in 1977, are continuing.

Analysis of the results of matched plantings of brook, lake, hybrid and backcross trout in small lakes in the Northeastern Region began in 1978 and early results have been prepared for publication. Generally the hybrid trout were much superior in both growth and survival to lake and brook trout.

Progress was made in 1978 on the identification of separate stocks of wild Ontario brook trout, lake trout and whitefish on the basis of their genetic characteristics. We are finding that these species function in many instances as more or less discrete stocks. These stocks are distinguishable by differences in biochemical characteristics as well as their morphology, physiology and behavior, particularly with respect to spawning.

An international symposium called the Stock Concept Symposium (STOCS) is being planned for 1980 to look at the implications of such findings to stock-by-stock fishery management in the Great Lakes area. Several of our staff are involved in the organization, data collection and preparation of scientific contributions on Ontario fish stocks for this symposium.

The development of stocks with biochemical tags to assess rehabilitation projects continued in 1978. Because these tags are inherited they will allow fishery managers to follow very exactly the contribution made by hatchery plantings derived from these stocks, not only in the first, but also in subsequent generations.

At the Great Lakes Research Stations and the Harkness Laboratory in Algonquin Park, investigations are being conducted into the roles of various environmental factors, fishing pressure and stocking programs on the production of game and commercial fishes. For example, attention is being given to the importance of competition from perch, predation by loons, and the particular strain of brook trout planted (wild or domestic) as manageable factors determining the success of brook trout fisheries in Algonquin Park and beyond.

Special efforts are being made to analyse backlogs of information by machine data processing facilities at Maple and at the field research stations. At the Lake Huron station, data are now available for analysis by machine essentially the same day collected, and substantial progress has been made in making the 30 years of past data similarly accessible. The experience acquired at this unit is now being applied by the Lake Ontario and Harkness Laboratory units, to make their extensive data collections more readily available.

A number of mathematical models, describing various aspects of the behavior of smallmouth bass populations, have been developed by the Systems Ecology Unit. These are being used as aids in defining environmental tolerance limits for this species. Models are also being developed to analyse the effects of different exploitation strategies on commercially important species.

In collecting data, fisheries scientists often obtain information of immediate use to local district management staff and they may advise local management staff. They also act as technical representatives of the Ministry on interministerial and federal-provincial committees, the International Joint Commission for Boundary Waters, and the Great Lakes Fishery Commission.

Fisheries Services

Fisheries Services Section is responsible for developing and carrying out programs relating to data processing, information, training and extension, as well as the preparation of legislation and the printing of fisheries regulations.

Most sales of non-resident angling licences increased in 1978. Non-residents bought 489,577 seasonal licences, 165,095 three-day licences and 5,449 organized camp licences. The sale of non-resident smelt licences (which includes bow-and-arrow fishing for carp) was 8,319.

The Canadian resident angling licence for non-residents in Ontario continued in popularity and sales numbered 27,813.

The Ontario Fisheries Information System (OFIS), a computer-based information system co-ordinated by the Section, provides management information to fisheries biologists. Major developments this year were the formation of an OFIS Management Committee to improve the usefulness and scope of OFIS and technical improvements to increase accuracy and reduce costs.

Population Dynamics

The major function of the Population Dynamics Section is to improve the technical competence of field staff by providing advice and expertise, and communicating the results of recent advances in fishery science and management pertaining to fish community dynamics. Critical review of field reports is an important component of this function. The Section also participates in the Lake Superior, Lake Huron, Lake Simcoe and Algonquin fisheries management committees.

The geographical reference atlas of the 2,000 lake trout waters in Ontario was converted from cassette tape to a computer format. A similar atlas of some 3,600 walleye lakes in Ontario was entered into the computer. Both data bases require some updating and extensive editing before field review.

The Section organized a one-week Percis training session, based on the published results of the Percis International Symposium, for approximately 100 staff in December, 1978.

Lands Administration Branch

Lands Administration Branch is responsible for the administration of Crown lands within the Province and the acquisition of private lands required for Ministry programs.

Land Acquisition

Land Acquisition Section is responsible for the purchase of private lands required for various Ministry programs such as public recreation and wildlife management. It provides assistance in setting acquisition priorities, oversees and approves each purchase, and maintains a computerized inventory of all property acquired. Newly acquired lands are managed on an interim basis to ensure optimum benefits until they are incorporated into Ministry programs.

More than 255,003 ha (630,128 acres) have been acquired since the Section's formation in 1962 — 2,075 ha (5,128 acres) during the past year.

Mining Lands

Under the Mining Act, Mining Lands Section is authorized to manage Crown mining lands as follows:

(a) Ruling on mining leases and exploratory licences of occupation (large tracts of land where normal claim staking is not feasible);

(b) Issuing permits for sand and gravel removal;

(c) Setting policy, formulation and interpretation of statutes;

(d) Auditing Mining Recorders' offices;

(e) Auditing Regional programs relating to all quarry permits and Beach Protection Act Licences issued; and

(f) Assessing all geophysical, geological and other technical survey reports submitted for assessment work.

Under The Beach Protection Act, the Section licences the removal of sand or gravel from beaches, banks or waters of all lakes and streams and regularly monitors such operations. These licences cover removal by private individuals as well as large commercial extractions which provide considerable revenue in the form of royalties. Liaison with Ministry field staff specialists and the Ministry of the Environment ensures that erosion or significant damage to the fish population or local ecology is prevented. Municipalities operating for municipal purposes are exempt from Ministry licensing and supervision.

The program of rehabilitating depleted pits and quarries on Crown lands throughout the Province has been temporarily suspended due to monetary constraints.

Public Lands

Public Lands Section has two primary functions: To oversee and monitor the management of the Province's 90 million ha (222 million acres) of Crown land outside Provincial Parks, and to provide technical support and guidance to the field offices responsible for the disposition of rights in public lands and waters.

Public Land Management involves the guidance and control of the numerous uses and users of Ontario's Crown lands and waters. Programs include the following: educating land users; controlling unauthorized occupations and adverse claims; operating garbage and litter control systems to maintain land and water quality; overseeing construction of roads, pipelines, etc., on Crown land; and controlling development on private land in unorganized territory.

Land disposition involves the granting of rights in land to a wide variety of client groups, i.e. individuals, corporations, government and government agencies. Land is disposed of for various uses by way of freehold and leasehold grants, temporary forms of tenure such as licences of occupation and land use permits, and agreements for the use of water for power generation. The Section also carries our post-disposition follow-up administration of transfers, renewals, cancellations, etc., of tenure documents, including leases in provincial parks.

Land related staff training co-ordination is an important contribution of this Section. Information and advice on public lands are provided to the general public. The main office formulates operational policy, directs field offices through policy and procedure directives, and monitors field performance through periodic field audits.

Starting last year, Crown cottage lots, which were previously offered by lease, are now available for purchase to eligible applicants including Canadian corporations. Lessees of existing cottage lots in subdivisions are allowed to obtain freehold title to their lots.

Titles

Titles Section prepares and maintains a written registry of the legal documents required for the ultimate disposition of Crown lands. It is responsible for the maintenance of the Ministry filing system that is used in conjunction with the registry for the administration of the Crown land base of the Province. A program to computerize the indexes of these land parcels, their survey plans and related file records is well under way and should be completed by 1984.

This Section levies mining acreage tax and carries out procedures necessary to effect forfeiture to the Crown of alienated mining lands when the owners default.

Conservation Authorities Branch

The objective of the Branch is to encourage the conservation and use of water and related land resources by Conservation Authorities by providing policy, funding assistance and management and planning direction to the Authorities.

The 38 Authorities cover most of Ontario south of the Precambrian Shield, as well as sections of northern Ontario around North Bay, Sault Ste. Marie, Sudbury, Timmins and Thunder Bay. They undertake a wide variety of programs to further the conservation, restoration, development and management of the renewable natural resources of their watersheds.

A Conservation Authority is formed as a result of a resolution from two or more municipal councils that petition the Minister of Natural Resources to convene a meeting for that purpose. If the vote of the municipal representatives is favorable, the Authority is established by an Order-in-Council. In general, the Authority's boundaries are then defined on a watershed basis. They may include a single watershed, such as the Grand River System, or a number of smaller and adjacent watersheds, such as the Cataraqui Region.

The Conservation Authorities Act ensures a provincial-municipal arranagement. The membership of each Authority includes representatives of all municipalities situated wholly or partially within the watershed, and up to three members appointed by the Province. Consequently, the initiative and sense of responsibility of the local communities are combined with the technical and financial resources of the Province to protect and develop the watersheds of Ontario.

Conservation Authorities place particular emphasis on water and related land management. They are also involved with auxiliary programs oriented to land use, forestry, fish and wildlife, outdoor recreation and conservation education.

All programs undertaken by the Authorities must have the approval of the Minister of Natural Resources. Each program involves a wide variety of resource management projects that receive financial assistance. Provincial grants are provided through the Conservation Authorities Branch. In some water management projects, the Federal Government may also participate.

The Authority raises its share of the funding by levying its member municipalities and by receiving aid from other sources.

At present, 14 Authorities employ a general manager or director of operations to supervise their programs under the direction of a chairman. Resources managers are supplied by the Province in 24 Authorities, including three instances where the services of a manager are shared by two Authorities.

Conservation Authorities relate to the Ministry's field organization at the regional level. Four regions have program supervisors to assist the Authorities in planning and implementing their resource management programs.

The grants to the Conservation Authorities totalled $32,330,807.51 during the fiscal year.

Administration

The past year saw the Conservation Authorities Branch move ahead with a number of important policies and long-term projects. The Report of the Working Group on the Mandate and Role of Ontario Conservation Authorities was prepared to provide the basis for discussion of the responsibilities of Conservation Authorities and their relationship to the Provincial government and member municipalities in the management of renewable natural resources of watersheds (other than gas, oil, coal and minerals).

During the year, a second Working Group prepared a revised draft of the "Watershed Planning Guidelines for Conservation Authorities". This important document outlines the process and basic procedures to be employed in the watershed planning program of the Conservation Authorities.

Four major comprehensive water management plans are being prepared in the Province. These studies are being undertaken on the Grand River, Thames River, South Nation River and the Lake Simcoe - Couchiching Basin. The Ministry, through both main office and regional representation, together with the respective Authorities and other Provincial Ministries, is represented in these planning studies.

The Environmental Assessment process is playing an increasingly important role in the major programs of the Conservation Authorities. Environmental assessments are being prepared for the proposed Glengowan and West Montrose dams and several other Conservation Authority undertakings.

In recent years, many Authorities have shown a renewed interest in land management programs and this, combined with the recent PLUARG (Pollution from Land-Use Activities Reference Group) Reports, has resulted in a greater emphasis being placed on assisting the private land owner to meet soil erosion, water quality and wildlife habitat concerns.

The boundary of the South Lake Simcoe Conservation Authority was enlarged and now contains an area of 2,613 km^2 (1010 square miles).

Some initiative was expressed regarding the formation of a Conservation Authority in the Kawartha area of southern Ontario, pending a favorable vote by the municipalities during the summer of 1979.

Water and Related Land Management

Programs within this Section relate to water management and flood control, and include projects such as flood plain mapping, environmental assessment, dams, channel improvements, erosion control structures and water quality monitoring. Grants to the Authorities under these programs totalled $22,439,889 during the year.

A total of 22.9 km^2 (8.8 square miles) of land was purchased by the Authorities in 1977 for water and related land management, bringing the total land holdings to 731.3 km^2 (282.2 square miles).

The Authorities operate a total of 281 water control structures. Twenty-two of the Authorities protect the residents of some 193 municipalities through the implementation of approved flood plain regulations. Water quality is monitored by 94 stations within the Authorities.

Conservation Authorities assisted private land owners by carrying out reforestation programs on 242 properties, streambank and gully erosion programs on 124 properties, and other private lands assistance on a further 32 properties.

The Lakehead Region Conservation Authority is in the early stages of a major flood control project on the Neebing and McIntyre Rivers in the City of Thunder Bay.

Construction has begun on the W. Darcy McKeough Diversion dam and channel by the St. Clair Region Conservation Authority. All necessary land has been acquired and contracts 1 and 2 are scheduled for completion in the fall of 1979. The Authority is negotiating flood easements for the dam and reservoir component of the project.

The Nickel District Conservation Authority began construction on the Nickeldale Dam and Reservoir in June of 1978 to provide flood protection on the west branch of the Junction Creek.

Construction continued on the Bennett - West Davignon Diversion project by the Sault Ste. Marie Region Conservation Authority. The project is expected to be completed in 1979.

The Upper Thames River Conservation Authority published the preliminary terms of reference for the environmental assessment of the Glengowan Dam and Reservoir.

The Grand River Conservation Authority completed the final stages of the environmental assessment on some of the water control structures in the watershed.

The Raisin Region Conservation Authority was granted approval for the construction of a drainage channel and a stormwater retention pond to alleviate flooding on the Fly Creek Channel in the City of Cornwall.

The South Nation River Conservation Authority is now in the final stages of the construction of the Chesterville Dam and Reservoir project. Completion is expected in 1979.

The Belleville Ice Control Dams were modified this year by the Moira River Conservation Authority to improve their effectiveness in reducing the risk of flooding on the Moira River.

Landfilling and acquisition of shoreline property were among the activities The Metropolitan Toronto and Region Conservation Authority conducted to further their Waterfront Development Project.

This was the first year of a long-term valley lands acquisition project initiated by the Grand River Conservation Authority. The purpose is to purchase properties designated as being subject to flooding as they become available.

Conservation and Recreation Land Management

This program includes projects related to land acquisition for conservation areas, development and landscape protection, reforestation and woodlot management, outdoor recreation, information and outdoor education, fish and wildlife inventories and pollution abatement. Grants to Authorities under this program totalled $3,973,686.

A total of 4.9 km² (1.9 square miles) of property was purchased by the Authorities in 1977 for conservation and recreation land management, bringing the total land holdings to 341.2 km² (131.8 square miles). Of this total, 183.6 km² (70.9 square miles) are set aside for recreation areas. These recreation areas were used by an estimated 4,798,675 people. Conservation Authorities provided 2,401 serviced and 4,484 unserviced campsites.

Trails operated in the conservation areas in 1977 were comprised of 734 km (456 miles) hiking trails, 79 km (49 miles) equestrian trails, 586 km (364 miles) cross-country skiing and snowshoeing trails, and 616 km (383 miles) snowmobile trails.

The Central Lake Ontario Conservation Authority has purchased additional land for the protection of wetlands and to allow the enlargement of Enniskillen Conservation Area.

The Credit Valley Conservation Authority has completed the construction of the western headland with the J. C. Sadington Park to be opened on that site in early June, 1979. Funding approval has been given to Phase II of the Mississauga Waterfront Plan.

The Grand River Conservation Authority has begun a major management and development program for the Luther Marsh Wildlife Management Area.

The Maitland Valley Conservation Authority has purchased property for the proposed Wawanosh Conservation Area, which will provide an over-all conservation program, primarily for the use of local residents.

The Metropolitan Toronto and Region Conservation Authority acquired property surrounding Gibson Lake, a natural water body in the headwaters of the Humber River. The area, in addition to protecting the headwaters, will be developed for a number of recreation activities.

Construction of a new administration building and resource centre in the Napanee Conservation Area has been undertaken by the Napanee Region Conservation Authority. The new complex will aid in the management of natural resources and is expected to be completed by early June of 1979.

Approval has been given for a multi-year program of the Nickel District Conservation Authority to carry out construction, servicing and improvements to develop the Lake Laurentian Conservation Area.

The Rideau Valley Conservation Authority constructed a new workshop complex in the Baxter Conservation Area to facilitate projects related to water and related land management and also to conservation and recreation land management.

As part of its program to provide greater public access to Lake Simcoe, the South Lake Simcoe Conservation Authority acquired property for the enlargement of the Willow Beach Conservation Area, and shoreline property for the proposed Holmes Point Conservation Area.

The Upper Thames River Conservation Authority has taken a program approach in the capital improvements plan it has for the Fanshawe, Wildwood and Pittock Conservation Areas, as well as the many rural conservation areas in its watershed.

Development work was carried out in many Conservation Areas across the Province.

Surveys and Mapping Branch

Mapping Services

Surveys and Mapping Branch commenced reorganization during the year to achieve a better functional grouping. Three existing sections, Cartography, Drafting Services and Nomenclature, and one new section, Ontario Basic Mapping, were brought together under Mapping Services, which assumed responsibility for mapping support to all Ministry programs. Efforts to co-ordinate the mapping activities of the Ontario Government, its agencies and municipalities, will continue.

Basic Mapping Section

The Government in 1977 approved a Basic Mapping Policy which provided for a program of orderly topographic mapping to cover Ontario at scales that would suit provincial and municipal needs. It also approved a common provincial geographical referencing grid.

The program was to proceed in two stages — start-up for the first three years and main production for ten years, by which time the Province would be adequately mapped. Surveying and mapping would be carried out by private industry and the Ministry would supervise the program with a small monitoring staff.

During 1978 the Ontario Basic Mapping Program was officially implemented, and a Basic Mapping Section was created to manage this and related programs. Funding came late in the year; nonetheless, a considerable amount of mapping was undertaken.

An inter-Ministry committee established initial priorities. Generally eastern Ontario and the area north of the north shore of Lake Huron were given highest priority; 130 medium-scale (1:10,000 and 1:20,000) maps were completed, and an additional 80 maps are scheduled for completion by July, 1979. In a large part of Eastern Ontario, control analysis and installation were commenced, laying a foundation for detailed mapping in 1979. Index maps showing map availability will shortly be available.

The Ministry of Northern Affairs, under its Regional Priority Program, made a valuable contribution by funding what was essentially a three-year bulk-test of the system. In the Wawa-Sault Ste. Marie-Haileybury-Mattawa area, photography and horizontal control were completed. In the Iron Bridge-Espanola area, 60 medium-scale maps were completed and an additional 20 are scheduled for completion in July, 1979.

Large-scale mapping projects (1:2,000) are in hand, covering some 40 northeastern Ontario communities. These projects are all scheduled for completion not later than April, 1980, and five or six northwestern communities are due for commencement early in fiscal 1979. Accurate property map overlays on these large-scale maps have been very well received.

Cartography Section

The Section generates the Provincial Topographic and Territorial Series of maps and handles the Ministry's major map brochures and allied colored graphics. Its greatest work load lies in the preparation of multi-colored lithographed maps for the Ontario Geological Survey and the Outdoor Recreation Group of the Ministry. Important smaller clients include other ministries.

Some highlights included the start of metrication of the Provincial Topographic Series of maps from 1 inch to 2 miles (1:126,720) to 1:100,000 and production of an innovative Geological Highway Map of Southern Ontario prepared for the joint annual meeting of the Geological Society of America, Geological Association of Canada and the Mineralogical Association of Canada held in Toronto.

Demands for field base maps by the Ontario Geological Survey quadrupled as the result of new programs being undertaken by that agency. Assistance was provided to the embryo Ontario Basic Mapping program both with photo mechanical and other support services and through secondment of staff.

Drafting Services Section

The Section provides a wide variety of drafting, mapping and graphic support services to Ministry programs with some minor support to other ministries that lack this capability. Its production is mostly in black and white.

Its major series of maps and plans are essentially graphic indexes to the status of land (most Crown Land) showing the disposition of surface and sub-surface real property rights, or illustrating forest resources, geological and mineral resources, lake resources, land use capability and conservation matters. Prints are available through the Public Service Centre.

Major production was as follows: Forest Resources Inventory base mapping, 42,735 km^2 (16,500 square miles); Forest Stand mapping, 41,440 km^2 (16,000 square miles); Mining claim and Township plans, new bases 50, revised plans 4,763; preliminary geological maps, 77; and miscellaneous charts, tables, graphics, 1,130.

Nomenclature Section

This Section provides the Secretariat to the Ontario Geographic Names Board and is responsible for maintaining a uniform inventory of geographical nomenclature for use by provincial and federal government agencies, particularly in map based programs.

The Board held four meetings at Algonquin Provincial Park, Ottawa, Toronto and Dorset during the year. The Section furnished background data for name submissions to the Board for later approval by the Minister.

The Section researches historical and archival sources for nomenclature information and conducts field nomenclature surveys. During the year it carried out field work in the following general localities: Timmins, Hearst, Kapuskasing, Blind River, Espanola, Chapleau, Wawa, Bracebridge/Penetanguishene, Owen Sound/Collingwood, Niagara, Cambridge and Tillsonburg.

Surveying Services

In 1978-9, re-organization of Surveys and Mapping Branch made Surveying Services one of the three primary divisions within the Branch, encompassing Surveys and Geographical Referencing.

Surveys

Re-survey of township boundaries, carried out by surveyors in private practice under agreement with the Ministry, continued at the same level as in previous years.

Cottage lots were laid out in plans of subdivision as requested in the four northern regions.

Survey service to Regions and other Branches and information and Crown survey records were provided as requested.

Control survey installations, under agreement with several municipalities, were carried on and some completed. Negotiations for new agreements are pending.

Geographical Referencing

A contract was awarded to the University of Guelph for the development of a pilot system for the semi-automated production of digital maps, associated reports and geocodes.

The Interministerial Committee on Geographical Referencing (ICOGR), formed last year, completed an inventory of 63 geographical referencing systems in Ontario. ICOGR also held a seminar on Geographical Referencing at which 200 delegates from all levels of government attended. The proceedings of the seminar were published. The proceedings include a section on a systematic series of grid cells which ICOGR has since accepted and recommended as a geographical referencing standard for Ontario for those who reference their data to grid cells.

The second precise calibration base line in Ontario established by the Ministry was installed in Scarborough, and a booklet, entitled "Precise Calibration Baselines in Ontario", was published. This booklet describes the conditions and procedures for use, as well as the location and measurements of the Mississauga and Scarborough Baselines.

Specifications and Guidelines for horizontal control surveys in Ontario were prepared and are soon to be published.

Development continued on the provincial horizontal control surveys data bank.

Ontario Centre for Remote Sensing

The Ontario Centre for Remote Sensing conducts projects applying the analysis of aerial photography, other forms of aerial imagery, and data from satellites to resource management and development. Projects are undertaken at the request of ministries, universities and the private sector.

To complement this function, the Centre also conducts research on the development of new methodologies of remote sensing application and on the practical applicability of new forms of remote sensing data. More than 50 research and applications projects were undertaken last year.

The program to map the surficial geology and wetlands of northern Ontario continued in 1978-9 with the completion of field sampling for an area of 150,000 km² (57,900 square miles). The past two years' work on this project have resulted in the completion of 15 1:250,000-scale map sheets of surficial geology, covering an area of 270,000 km² (104,000 square miles), and, last year alone, 12 map sheets of beach deposits in the Hudson-James Bay lowlands, covering an area of 140,000 km² (54,000 square miles), were prepared. Work began on the preparation of detailed reports to accompany the map sheets.

The results of research on two remote sensing methodologies for the assessment of forest regeneration success were submitted to the Forest Resources Group, where they were identified as a landmark in the development of regeneration success survey methods.

The Centre continued the development of an aerial forest sampling procedure. The programs to detect forest damage by disease and infestation were also continued.

The Centre undertook two new forestry-related projects — the identification of trees under stress in the whole Metropolitan Toronto, and the detection on aerial thermography of frost-prone areas on large cutovers, as an aid to reforestation.

Aerial thermographic coverage was obtained of the City of Peterborough for the detection of heat loss from buildings, and a clinic was subsequently held in Peterborough by the Ministry of Energy, with the assistance of the Centre, to present the thermographs of individual houses to the homeowners. A handbook on how to set up and operate a thermography clinic was prepared to enable the communities, themselves, to take over the public-education phase of thermography programs.

Aerial thermography was applied to the detection of groundwater springs. Other projects related to the management of water resources were the development of aerial photographic methodologies to determine the distribution and density of algae in the Great Lakes, and to detect the escape of polluted water from landfill sites.

Two projects were undertaken to establish aerial photographic techniques for detecting subsurface remains of early habitation on sites suspected to be of archeological interest.

Experiments were conducted on the applicability of airborne synthetic-aperture radar to forest regeneration assessment and to the mapping of structural geology.

Several advances were made in 1978-9 in the Centre's airborne sensing program. The use of a computerized system to control the motorized firing of each of several cameras at a different interval was perfected, permitting precise control of the degree of overlap between images. Research that provided more detailed information on the effect of each airborne sensing variable on the data obtained made possible greater consistency in the quality of imagery.

In 1978-9, the installation of the OCRS digital image analysis system was completed and the installation of software provided by the Canadian Forestry Service began.

Five training courses were conducted by the Centre, two courses on remote sensing for land use planning, one on remote sensing and photo interpretation for forestry-related purposes, and two on the on-site identification of forest soils. Two one-day courses were also given to the Ontario Association of Geography Teachers and to staff of the Ministry of Agriculture and Food.

Presentations on the usefulness of remote sensing and on the Centre's new developments were given to Ministry personnel, other ministries, university audiences and representatives of private industry, as well as to national and internatioanl groups.

Advice and assistance in the use of remote sensing imagery and methods of analysis were provided to many hundreds of visitors to the Centre. Two scientific papers were delivered at national remote sensing conferences and two further papers at an internatioanl remote sensing conference held in West Germany.

Land Use Co-ordination Branch

The Land Use Planning, Land Use Liaison, Special Projects and Plan Review Sections, which comprise the Branch, continued to co-ordinate Ministry land use planning. They assisted other ministries and planning agencies, such as municipalities, with land use plans, and maintained a sensitive areas recording system. The Branch updated environmental assessment procedures for Ministry undertakings and co-ordinated Ministry environmental assessment responsibilities.

Strategic Land Use Plan

The strategic land use plan is a very broad and long-term plan to indicate how the Ministry of Natural Resources wishes to use, or to influence the use of, land and water in Ontario. This plan will be the major means of co-ordinating all the more detailed Ministry land use planning such as district plans.

The strategic land use plan consists of: (1) the provincial plan, which outlines the policies to be applied to Ministry land use plans; and (2) a broad land use plan for each of the three planning regions (Northwestern Ontario, Northeastern Ontario and Southern Ontario).

The provincial plan was completed in 1975 and is currently undergoing a revision.

The planning process for the regions was organized in three phases: (a) Background Information; (b) Policy; and (c) Plan. Progress in each of the planning regions is as follows:

Northwestern Ontario. Background information and policy development is complete. A draft of the plan has been prepared but has not yet been approved.

Northeastern Ontario. Background information is completed. A draft of the proposed policy and of the proposed plan has been prepared but not yet approved.

Southern Ontario. The program here is called the Coordinated Program Strategy and both background information and policy are completed. The plan has not yet been prepared.

Land Use Planning

Upon approval of the three Regional Strategic Land Use Plans, more detailed land use plans will be prepared for the Ministry's 49 districts. District land use plans follow the same three-phase process and during the past year many districts began collection and analysis of background information.

The Minstry's West Patricia Land Use Plan, occasioned by the proposed licensing of new Crown timber limits north of Dryden to Reed Paper Ltd., will be a composite of the Red Lake, Sioux Lookout and Geraldton District Land Use Plans.

Several Districts also prepared local area land use plans which will guide Ministry programs until the completion of district land use planning.

Plan Input and Review

The land and water base for meeting the Province's long-term natural resource needs must not be adversely affected by the land use plans and actions of others. Seeking to influence these actions through plan input and review is, therefore, an essential activity of the Ministry.

Much of the Ministry's plan input and review activity continues to be directed at municipal planning and at private development proposals, both of which come under The Planning Act. Such planning assistance and review is also carried out with other provincial and federal ministries and agencies. During 1978-9 the Ministry continued to work closely with Ontario Hydro on transmission corridor and generating station locational studies and provide input to the Niagara Escarpment Plan.

The Branch, in consultation with Ministry field offices, completed a final draft of a revised Plan Input and Review Handbook. It is designed to guide field staff and promote consistency throughout the Ministry. The Branch audited five Regions in the plan review activity to help ensure a high level of performance.

In plan input and review, the Ministry responds to activity and demands from outside sources. The number of plan inputs and reviews continues to increase.

Lake Planning

The Ministry's new three-year cottaging initiative, to terminate in 1977-8, was extended for one more year. The program is intended to increase the number of cottage lots provided on Crown land in northern Ontario and determine at what level the program can be maintained.

A report on the initiative was completed and future program direction was proposed. Comprehensive lake plans were prepared by field staff following guidelines in the Branch's Lake Planning Manual.

An order based watershed mapping and evaluation method, suitable for a number of planning purposes, is nearing completion.

Environmental Assessment

The Branch continued to develop class environmental assessments for a number of undertakings. The task of continually refining the Ministry's responsibility under The Environmental Assessment Act was also an important part of the Branch activity.

Special Land Use Related Projects

The Branch continued to provide Ministry co-ordination for two land use related projects: The Reed Proposal and The Royal Commission on the Northern Environment. It also continued to co-ordinate the Ministry's participation in the Lakeshore Capacity Study.

One special project was undertaken at the request of the Management Improvement Plan Office. This involved the direction of work of a Task Force on the Ministry's Resources Planning System. The Branch also directed the Stage 2 Organization Review for the Lands and Waters Group.

In addition the Branch conducted a review of The Resource Access Activity policy relative to location and control of access roads.

The Branch is conducting a study of the need for, and the feasibility of, an information system for planning. This would be a computer based system to store and retreive data for any geographical area within Ontario. A system of this nature will become increasingly important in the future when plans that have been completed will require constant monitoring and revision.

Engineering Services Branch

The objectives of the Branch are to provide for the control of surface waters and the regulation of improvements therein; to design and construct water management facilities to prevent flooding and erosion; to provide an engineering and construction support service to Ministry programs; and to co-ordinate resource access construction and maintenance.

Pre-Engineering and Design

Projects included dams at Berry Lake, Thunder Bay Tree Nursery, Sphene Lake, Maskinonge Lake, Peshu Lake, Mattawa, Graham Lake, Fox Lake and the Kintail Milldam; docks at Springwater Lake, Sioux Lookout, Chapleau and Gogama; and bridges at Vermillion River, Lost Lake, Pikitigushi River, Namakan River, Little Turtle River, Frazer Creek, Thieving Bear Creek, Antoin Creek, Fitzroy Provincial Park, Garden River, Wenebegon River, Kinniwabi River and Goat River.

Other work included the design of a water distribution system for Skelton Lake Hatchery and assistance in the South Nation River Study. Pre-engineering was completed for a weigh-scale at Chapleau.

Soils investigations were carried out for Wenebegon River Bridge and Chapleau Dock. Other soils investigation work was done at the Julian Reed Dam in Norval and at Duffin Creek in conjunction with the Federal Government Sea Lamprey Control Program.

Construction

A water-control structure was built at Berry Lake and construction was completed on dams at Sideburned Lake, Upper Island Lake and Gooseneck Lake. Reconstruction of Maskinonge Lake Dam was commenced.

To increase water storage for irrigation at the Thunder Bay Tree Nursery, the existing dam was extensively modified and excavation was carried out in the headpond.

In the Upper Canada Bird Sanctuary, the second phase of the dyking project (Dyke A) was completed.

Bridges were built at Vermillion River, Lac Seul Indian Reserve Access Road, Pikitigushi River, Antoin Creek, West Aubinadong River and Carpenter Lake. Docks were cosntructed at Manitouwadge and Springwater Lake.

Ponds were constructed at Luther Marsh and Mount Pleasant, and erosion control work was continued along Wilmot Creek.

The water distribution system for Petawawa Fish Hatchery was completed, and a start was made on the installation of metric water level gauges on the Muskoka River watershed.

Maintenance of Hydraulic Structures

Extensive maintenance was carried out at McFarlane Lake Air Base Dock, and repairs and renovations were made to South Procupine Air Base Dock.

Major repairs were made to Kakabeka Falls Bridge, and ice damage to the Keewatin Boat Lift was rectified.

A dock at Stonecliffe was rehabilitated. In addition some 68 other ministry docks and dams were renovated and repaired under the Ministry maintenance program.

Water Management

The Branch provides for the operation of Ministry-owned dams for recreation, fish and wildlife protection, flood and erosion control, and Ministry service purposes.

The Branch provides for the regulation of construction, operation and maintenance of private dams, diversions, channelization, water crossings and other water control structures through administration of The Lakes and Rivers Improvement Act. The following activities took place in the regualtion of private water control structures under this Act:

	1979	*1978*
Location Approvals	258	221
Plans and Specifications Approvals	144	92
Refusals of Applications for Approval	9	23
Inquiries Held Under the Act	1	5
Minister's Orders Issued	3	1
Investigations of Water Regulation Problems	963	650

Great Lakes water levels and flows are continuously monitored through reports and information obtained from the International Lake Superior Board of Control and the International St. Lawrence River Board of Control.

The Branch represents provincial interests on the Lake of the Woods Control Board in the regulation of Lake of the Woods and Lac Seul, and on the Ottawa River Regulation Planning Committee which is developing recommendations for regulation of the Ottawa River, an operational application of a forecast model, development of a flood warning system, a liaison mechanism with St. Lawrence River regulation and an Ottawa River Operating Committee.

Great Lakes Shore Management

The Branch aids in the development of shore management policies and provides technical expertise for the alleviation of flood and erosion damage along Great Lakes shores. Current efforts are aimed at implementing recommendations presented in the Canada-Ontario Great Lakes Shore Damage Survey Technical Report, released in 1975. The main purpose of the survey was to compile data detailing the extent of 1972-3 damages, to provide information on shore characteristics.

A Shore Management Guide is under preparation in response to the Technical Report recommendation that methods be developed to evaluate shoreland management alternatives to mitigate flood and erosion damages. The three basic alternatives investigated are land use regulation, public acquisition and structural protection. A 30 km (19-mile) length of Lake Erie shoreline in Gosfield South and Colchester South townships is being used to develop and test methodologies.

Shore management alternatives will be assessed on the basis of land value, ownership, cost of protective works, erosion and recession rates, flood probability, related cost-benefit studies and qualitative environmental evaluations. The results of the study will be generally applicable along Great Lakes shores and will be circulated to municipalities, Conservation Authorities and planning agencies.

Monitoring of shore processes has been undertaken, as recommended by the Technical Report, to ensure maintenance of current information on shore characteristics. Ground profiles are taken annually and after major storms at about 165 permanent erosion stations established on the erodible portion of the Great Lakes.

As part of an ongoing Great Lakes public awareness program, a brochure, entitled "Shore Property Hazards", was published as a joint production of Fisheries and Environment Canada and Ontario Ministry of Natural Resources. It is designed to inform the public about the potential hazards associated with living on the Great Lakes shore and has been distributed to municipalities and conservation authorities.

The Branch is involved in References given to the International Joint Commission by the Canadian and United States governments through participation on the Working Committee of the International Diversions and Consumptive Uses Study Board, and on the Working Committee and Coastal Zone Sub-committee of the International Lake Erie Regulation Study Board.

Resource Access Roads

Co-ordination and consultation were provided for the construction and maintenance of forest access roads, and assistance was given to the Northern Ontario Resource Transportation Committee secretariat.

A total of 8343 km (5,182 miles) of forest access, Ministry service, recreational access, public transport and Agreement Forest roads were maintained.

The Ministry also shared, by agreement, the cost involved in maintaining 570 km (354 miles) of private forest roads constructed by industry.

The Ministry's normal program of road construction and reconstruciton in southern Ontario resulted in the completion of 102 km (63.25 miles).

The Ministry participated in road construction funded by the Ministry of Northern Affairs under a cost-sharing agreement with industry for a total of eight miles of forest access road.

The Ministry of Northern Affairs also provided funding for the construction, reconstruction and maintenance of the following in support of Ministry programs in northern Ontario:

	km	*Miles*
1. Normal Program		
Forest Access road and bridges......	237	147
2. Regional Priority Budget		
Forest access roads...............	50	31
Summer cottage roads	58	36
Crown land subdivision roads	19	12
3. Northern Ontario Resources Transportation Committee		
Construction or reconstruction of forest access and public transport roads, bridges, and other projects...	90	56
Winter roads	108	67
Snowmobile trails	66	41
Maintenance of public transport roads	166	103

Flood Emergency Response

As "lead ministry" the Ministry maintains a program to co-ordinate the response of the Government of Ontario to flood emergencies declared by the Minister. The Branch administers this program on behalf of the Provincial Co-ordinator.

While a number of flooding and potential flooding situations were monitored by district managers during the past year, there was no requirement for a declaration of a flood emergency by the Minister.

Office of Indian Resource Policy

The Office of Indian Resource Policy was established in 1976 as a separate entity with the responsibility for researching and responding to Indian land claims and other Indian land problems, co-ordinating all of the Ministry's involvement in matters relating to Indian people, and providing a consultant type of role within the Ministry on all such matters.

It performs a Central Registry type of function for all land deals with Indian people by any Ontario Ministry and Ontario Hydro. It is responsible for keeping the Ministry (and Government) aware of the possible extent of future land claims and their significance.

The Office develops Ministry positions on these claims and prepares recommendations to Cabinet. It undertakes research for these in consultation with other Ministries and with the Federal Government and Indian bands and their associations. On the direction of Cabinet, it negotiates the settlement of valid land claims with the Indian people involved. The Office also develops and co-ordinates Ministry policy that has a significant impact on Indian people.

Aviation and Fire Management Centre

Fire Management

A total of 940 forest fires burned over 7524 ha (18,591 acres) in Ontario during the 1978 fire season. Included were 14 fires which occurred within the fire district but outside the area of intensive protection. These fires burned over 3989.4 ha (9,857.9 acres).

Unlike the previous four years in which the province experienced some of its most severe fire seasons, 1978 was considered to be far below average. Since 1917, when Ontario started recording forest fires, there have only been seven years with fewer outbreaks and seven years with a smaller area burned.

Although precipitation throughout most of Ontario was only slightly above normal, the rain fell at regular intervals and prevented the forests from drying to a point where they would cause serious fire problems. Southern and southeastern Ontario experienced drought conditions which resulted in a rash of fires in that area during the latter part of July. This condition re-surfaced again in the fall.

Aircraft utilization was reduced by the Tracker fleet of six aircraft which had to be grounded due to extensive corrosion problems. Four of the aircraft were reconditioned to be operational for the 1979 fire season. They will be based at Sudbury and undergo an intensive two-year development program. A decision will then be made to either stick with, or phase out, the Tracker fleet.

Fire Prevention

There were no major changes in this program from 1977. Car litter bags were produced, and a small berry box was produced with appropriate prevention messages printed on the outside. These are given out in areas where berry pickers increase the risk of wild fires.

Training

Six fire accounting courses, one week in duration, were held from January through March at various locations throughout the province to upgrade fire accounting skills.

A basic fire suppression course (Fire Course I) was conducted during the latter part of June.

Four staff assisted with the Instruction Training Course held at Memramcook, N.B. Ontario and Manitoba shared an Instructor Training Course in March, 1979.

A Fire Weather Course was held during November. This course was able to accommodate two Parks Canada and two Province of Manitoba candidates.

The regions held a series of Fire Service courses, as well as a number of refresher course, to bring their senior fire staff up to date on the latest fire technology.

Development Work

During 1978, a number of projects were undertaken. A relatively inexpensive system that accurately determines the strike locations of cloud-to-ground lightning was developed at the University of Arizona. Two antennae, each with an effective radius of about 322 km (200 miles), and a position analyser to process the strike information, were purchased and installed in northwestern Ontario.

Work on the Landsat satellite imagery project continued to evaluate it for fire management use in Ontario. Forest cover type identification, fuel type identification, cutover identification, water sources, and road, pipeline and Hydro line locations were specifically evaluated.

Various kinds of computer programs, which may aid fire managers in making complex decisions, were evaluated in the North Central Region of the province. These included forest fire occurrence and arrival prediction, fire growth and behavior models, and various prescribed burning, planning aids. Other computer applications evaluated included equipment inventory, aircraft cost and hours accounting.

Work was continued on several co-operative projects of the Great Lakes Forest Research Centre. These projects were in the areas of fire behavior, fire ecology, and prescribed burning research.

Finance and Administration Group

Budget and Financial Analysis Office

This unit is responsible for the final preparation of the Ministry estimates, advising on and monitoring budget allocation changes, analysing financial data, and other finance related matters.

Systems Co-Ordination Office

The prime functions of this unit are to co-ordinate and monitor the computer-systems activities of the Ministry and provide managers with guidance in the development, maintenance and upgrading of these systems.

Administrative Services Branch

Records and Forms Management Section

The Section is responsible for application of effective program techniques, as required by the Manual of Administration, and for the provision of technical advice to all sectors of the ministry.

Records Management

The unit is responsible for maintaining an accurate inventory of all records, records equipment and microrecording equipment; control over the initiation, maintenance, protection, retention and disposition of all Ministry records; conducting feasibility studies regarding all microrecording systems and submitting all proposals to senior management for approval and to Management board when necessary; conducting training seminars for the Ministry in all aspects of records management; developing Ministry file classification plans; and conducting word processing feasibility studies.

Forms Management

The unit is responsible for establishing, maintaining and reviewing an inventory of Ministry forms; reviewing and approving all requests for forms printing; improvement in design of necessary forms by adherence to Ministry and government-wide design standards; providing forms analysis and design service to users; providing technical guidance to form originators; and conducting training seminars in forms management and design for Ministry personnel.

Accommodation Section

The basic role of the Section is the assessment of the accommodation needs identified by each program, the annual preparation of the Ministry accommodation plan for submission by the Ministry of Government Services to Management Board for funds, the co-ordination of services thus provided; and the control of individual accommodation projects. The role relates to the provision of new capital and leased facilities, and the upkeep of existing facilities.

The major construction projects completed during the year included the Huronia District Office, Ignace District Office, Dorion Hatchery Main Station, Dryden Nursery Irrigation System, Swastika Nursery Irrigation System Phase 1, and the St. Williams Nursery Refrigerated Storage Facility.

Supply Section

Supply Management

The unit is responsible for co-ordinating Ministry procurement policy and assisting Ministry offices on procurement matters. Duties include the issue and revision of directives of purchasing; preparation of standard purchase forms and specifications; assistance in preparing contract documents and tendering needs; co-ordination of the Ministry purchasing officer training; and the Federal-Provincial Reciprocal Tax program for the Ministry. A Supply Manual was issued to lend additional support and guidance to our purchasing offices.

Purchasing

The unit is responsible for the purchase of most goods and services for main office and for a few field offices. The unit acts as the Ministry's liaison with the Ministry of Government Services in the purchase of office furniture and furnishings. It establishes bulk purchase agreements and standing offers where feasible, and it offers assistance and guidance on the research and development of new sources of supply. It co-ordinated a "Buy Canada" Exhibition for the Ministry and now assists in the preparation of submissions to Management Board under the purchase of Audio Visual equipment policy.

Central Supply Warehouse

The warehouse provides a warehousing and distribution service for common Ministry items such as forms, publications, maps, uniforms, permits and licences. It is located at 733 King Street West, Toronto, and uses 3580 m² (38,500 sqaure feet) of space. It issues a monthly inventory report and assists in the preparation of a semi-annual Forms and Publications Catalogue which is distributed to all Ministry offices. It also provides a small-delivery-van service for daily service between main office and the warehouse, in addition to emergency pick-up service within Metro limits.

Services Section

The resonsibilities of the Section manager include the co-ordination of the Ministry's consumer service and energy conservation programs.

The co-ordinator of hospitality and parking is responsible for arranging Ministry functions, conferences and air transportation and co-ordinating Ministry parking.

Office Management

The unit is responsible for the following:

Design, issue and replacement of uniforms;

Continual updating of the Ministry's listings in telephone directories across the province;

Issue of identification cards and telephone credit cards to Ministry staff;

Distribution of government manuals and their revisions as well as the Ministry's policy and procedure directives;

The equipment inventory control system and main office equipment inventory control records;

The copy room which provides printing services for main office;

The mail room and messenger service; and

The telex operation at main office.

Data Processing

The unit accepts for keying the source documents for the Ministry's production data processing systems; schedules, submits and receives computer runs and sees that reports are distributed to user branches; maintains Ministry magnetic tape library; administers the Ministry's magnetic tapes retained in the library of the Central Computing Branch; maintains sufficient systems documentation to enable a contract programmer to carry out maintenance or minor revisions when requested by user branches; assists user branches in identifying computer problems and suggests means of rectifying problems; and keys data from source documents onto magnetic tape or tab cards in a predetermined format. The cards and tapes are interpreted by the Ministry's computer programs to produce the desired reports.

Public Service Centre

The Centre is responsible for the sale and distribution of Ministry publications, maps, aerial photographs, and hunting and fishing licences. The maps handled include the Provincial, Fishing, Territorial, Geological and Topographic series, the National Topographic series, and the county maps of the Ministry of Transportation and Communications.

A Natural Resources information booth on the main floor of Whitney Block provides information to visitors and handles general inquiries by telephone.

Fleet Management

Unit responsibilities include the following:

Purchase and disposal of vehicles and equipment;

Development of vehicle specifications;

Licensing of vehicles and trailers;

Issue of gasoline credit cards;

Fleet inventory;

Development of computerized fleet management program; and

Establishment of province-wide contracts for automotive supplies.

Financial Services Branch

The Branch provides accounting and financial adminstrative support services for the Ministry. It maintains records of revenue and expenditure, prepares financial statements, and supervises and co-ordinates the account functions of main office and field offices. Its responsibilities include expenditure control, development of accounting and financial reporting systems, development and distribution of financial policies and procedures, financial and cost analyses, pre-audit controls and procedures, preparation of claims under federal-provincial and sundry other agreements, and control of security deposits.

The Branch also provides financial liaison with the Management Board of Cabinet, the Ministry of Treasury and Economics, the Provincial Auditor, other ministries and agencies, and the Government of Canada.

Financial Report

Statement of Revenue in 000s for year ended March 31, 1979

MINISTRY ADMINISTRATION			
Reimbursement of Expenditures — Government of Canada			
Canadian International Development Agency		$ 12.8	
Sales and Rentals			
Maps, publications, etc	$ 479.1		
Ministry Houses	436.7		
Electrical power	21.7	937.5	
Recovery of Prior Year's Expenditures			
Salaries and employee benefits	$ 27.7		
Duplicate or overpayments, credit notes and goods returned	10.7		
Cheque cancellation	5.3		
Agreement with the Municipality of Waterloo	3.5		
Accident claims	3.0		
Miscellaneous	3.4	53.6	
Miscellaneous Revenue			
Reserve for outstanding cheques	$ 28.0		
Others	3.1	31.1	$ 1,035.0
LAND MANAGEMENT			
Taxation - Mines acreage tax		$ 573.4	
Reimbursement of Expenditures — Government of Canada			
ARDA — Conservation Authorities	$ 497.2		
Dams, reservoirs and channel improvements	78.3	575.5	
Reimbursement of Expenditures — Others			
Recovery of Fire Fighting costs		391.6	
Fees and licences — Mines		427.5	
Sales and rentals			
Leasing and licensing of lands	$ 1,237.2		
Gas and mining leases	827.9		
Land and buildings	824.3		
Equipment	221.3		
Sundry sales	30.9	3,141.6	
Royalties			
Water power	$16,132.3		
Forest protection charges	1,833.0	17,965.3	
Recovery of Prior Year's Expenditures			
Conservation Authorities	$ 127.8		
Agreement with government agencies	9.0		
Remote Sensing	7.6		
Land Acquisition	5.4		
Salaries and employee benefits	4.5		
Miscellaneous	3.2	157.5	
Miscellaneous Revenue		16.9	23,249.3
OUTDOOR RECREATION			
Reimbursement of Expenditures — Government of Canada			
ARDA — Extension of Redevelopment Area Parks	$ 236.7		
Fisheries Industrial Development Agreement	50.2		
Pukashwa National Park	39.9		
Rideau and Trent Canal Waterways and Adjacent Land Use Management	11.6	338.4	
Recreation Areas			
Park entrance and camping fees	$ 6,237.6		
Park concessions	254.4		
Park Miscellaneous	63.9	$ 6,555.9	

Fish and Wildlife			
Hunting and fishing licences	$11,451.1		
Royalties	562.6		
Confiscated articles	32.5		
Miscellaneous — Fish and Wildlife	6.2	12,052.4	
St. Lawrence Parks			
Fees	$ 1,791.4		
Sales	1,438.5		
Facilities	116.6		
Miscellaneous	14.4	3,360.9	
Recovery of Prior Year's Expenditures			
Salaries and employee benefits	$ 5.9		
Winter Trails Recreation Program	4.4		
Miscellaneous	2.7	13.0	22,320.6
RESOURCE PRODUCTS			
Renewable Resource Development			
Recovery of Prior Year's Expenditures			
Regional Priority Projects	$ 125.4		
Managed Forest Tax Reduction Grants	9.2	134.6	
Reimbursement of Expenditures — Government of Canada			
Forest Management			
ARDA — Forest Stand Improvement	$ 483.9		
ARDA — Private Land Forestry	250.0		
ARDA — Expansion of County and Authority Forest in Ontario	61.6		
Commercial Fish and Fur			
Resource Development Agreement	253.9	1,049.4	
Forest Management			
Stumpage	$37,193.5		
Forest products	494.5		
Stock production	242.4		
Miscellaneous timber	87.8	38,018.2	
		$39,202.2	
Non-Renewable Resource Development			
Mining Tax		$41,799.1	
Royalties (Mines)		1,380.8	
Commercial fishing licence		96.8	
Fees, licences		80.5	
Miscellaneous		6.6	
		$43,363.8	82,566.0
RESOURCE EXPERIENCE			
Frost Centre facilities			230.6
TOTAL REVENUE			$129,401.5

Statement of Expenditure in 000s for year ended March 31, 1979

MINISTRY ADMINISTRATION PROGRAM		
Main Office	$ 2,415.8	
Financial Services	1,983.8	
Supply and Office Services	2,920.9	
Personnel Services	909.7	
Information Services	1,332.0	
Analysis, Research and Planning	583.6	
Legal Services	484.7	
Audit Services	503.2	
Field Administration	13,204.5	
Total for Ministry Administration		$ 24,338.2
LAND MANAGEMENT PROGRAM		
Water Control and Engineering	$11,196.8	
Forest Protection	16,155.7	
Air Service	4,645.0	
Extra Fire Fighting	1,549.1	
Resource Access	4,387.7	
Land and Water Classification	7,789.2	
Land, Water and Mineral Title Administration	11,869.4	
Conservation Authorities	34,649.9	
Total for Land Management		92,242.8

OUTDOOR RECREATION PROGRAM		
Recreational Areas	$28,522.8	
Fish and Wildlife	23,450.8	
St. Lawrence Parks Commission	7,648.0	
Wasaga Park Community Project	1,164.8	
Total for Outdoor Recreation		60,786.4
RESOURCE PRODUCTS PROGRAM		
Mineral Management	$ 9,164.9	
Forest Management	49,687.9	
Algonquin Forestry Authority. The Algonquin Forestry Authority Act	20.0	
Total for Resource Products		58,872.8
RESOURCE EXPERIENCE PROGRAM		
Junior Rangers	$ 4,421.3	
Youth Corps (Experience '78)	4,751.6	
Leslie M. Frost Natural Resources Centre	975.1	
Total for Resources Experience		10,148.0
TOTAL BUDGETARY EXPENDITURE		$246,388.2

Personnel Services Branch

Senior Administration Staff

March 31, 1979

Deputy Minister

Dr. J. K. Reynolds

Assistant Deputy Ministers

W. T. Foster, Southern Ontario
J. W. Keenan, (Acting) Policy and Priorities
L. Ringham, Northern Ontario

Regional Directors

R. A. Baxter, North Central (Thunder Bay)
W. G. Cleaveley, Northeastern (Sudbury)
R. M. Dixon, Central (Richmond Hill)
T. W. Hueston, Eastern (Kemptville)
K. K. Irizawa, Algonquin (Huntsville)
G. A. McCormack, Northwestern (Kenora)
J. R. Oatway, Northern (Cochrane)
N. D. Patrick, Southwestern (London)

Executive Co-ordinators

D. P. Drysdale, Program Management Evaluation
L. H. Eckel, Outdoor Recreation Group
G. A. Jewett, Mineral Resources Group
J. W. Keenan, Lands and Waters Group
A. H. Peacock, Forest Resources Group
G. D. Spry, Finance and Administration Group

Directors

R. J. Burgar, Conservation Authorities Branch
R. G. Code, Surveys and Mapping Branch
G. P. Elliott, Management Improvement
H. B. Farrant, Human Resources Planning
W. K. Fullerton, Forest Resources Branch
A. C. Goddard, Financial Services Branch
G. A. Hamilton, The Leslie M. Frost Natural Resources Centre
A. Jackel, (Acting) Personnel Services Branch
K. H. Loftus, Fisheries Branch
E. Markus, Timber Sales Branch
Dr. T. P. Mohide, Mineral Resources Branch
F. Moritsugu, Information Services Branch
S. B. Panting, Engineering Services Branch
Dr. E. G. Pye, Ontario Geological Survey
J. A. Queen, Administrative Services Branch
R. A. Riley, Land Use Co-ordination Branch
J. D. Roseborough, Wildlife Branch
W. L. Sleeman, Aviation and Fire Management Centre (Sault Ste. Marie)
(Vacant) Policy Co-ordination Secretariat
(Vacant) Lands Administration Branch
R. J. Vrancart, Provincial Parks Branch
A. A. Ward, Internal Audit Services Branch
E. G. Wilson, Office of Indian Resource Policy

Head

Dr. D. Burger, Ontario Forest Research Centre (Maple)

District Managers

W. D. Adlam, Ottawa District
E. N. Arbuckle, Espanola District
J. R. Bailey, Lanark District
R. G. Bailey, Napanee District
M. P. Barker, Atikokan District
L. L. Bronson, Pembroke District
W. R. Catton, Cambridge District
J. K. Cleaveley, Geraldton District
D. J. D'Agostini, Fort Frances District
P. R. Davidson, Aylmer District
J. E. Dickenson, Niagara District
C. Dionne, Gogama District
T. E. Dodds, Ignace District
I. B. Earl, Maple District
R. Elliott, Chapleau District
C. E. Emblin, Hearst District
H. P. Endress, Dryden District
E. W. Everley, Red Lake District
D. R. Fortner, Chatham District
J. F. Goodman, Sioux Lookout District
O. Goodman, Bancroft District
C. R. Gray, Lindsay District
L. J. Haas, Terrace Bay District
D. L. Hagar, Blind River District
J. E. Hamilton, Thunder Bay District
G. O. Koistinen, Nipigon District
J. H. Lever, Bracebridge District
R. G. Lightheart, Kapuskasing District
W. J. Lovering, Parry Sound District
W. D. Mansell, Huronia District
R. B. McGee, Simcoe District
D. B. McGregor, Kenora District
D. E. McHale, Sudbury District
J. G. Minor, Kirkland Lake District
J. R. Morin, Cornwall District
D. J. O'Grady, White River District
A. F. Papineau, Timmins District
N. Richards, Wingham District
E. Rogers, North Bay District
J. E. Rumney, Temagami District
J. H. Sellers, Sault Ste. Marie District
J. A. Simpson, Algonquin Park District
A. J. Stewart, Moosonee District
W. J. Straight, Wawa District
R. W. Tippett, Owen Sound District
R. H. Trotter, Brockville District
D. D. White, Minden District
G. A. Wright, Cochrane District
W. Vonk, Tweed District

Total Staff

March 31, 1979	Regular	Proba- tionary	Unclassi- fied	Total
Main Office	823	107	265	1,195
Field Offices	3,096	349	1,433	4,878
Total	3,919	456	1,698	6.073
Total Complement of Positions				4,586
Vacancies in Complement				213
Regular and Probationary Staff				4,373
New Employees Hired 1978/79				862

Professional Staff

March 31, 1979	
Biologists	150
Economists	9
Engineers	9
Foresters	287
Geologists	57
Park Planners	29
Scientists	48
Miscellaneous	50
Total	639
Resource technicians	1,663
Licensed scalers	1,164

Staff Turnover*

March 31, 1979	
Deceased	8
Transferred	32
Released	4
Resigned	146
Dismissed	0
Retired	97
Total	287

*The ratio of separations to the total of regular and probationary staff at March 31, 1979, was 7.4 per cent.

Safety

The staff of Safety Programme Development Section were involved with Ministry employee safety programmes; the safety of the general public in provincial parks and other Crown lands; training employees in first aid; vehicle driver improvement programmes; fire safety procedures; water safety; supervisory training in accident control; job safety planning; and inspection of work areas and equipment vehicles.

The following numbers of employees were trained as noted:

Accident Investigations	69
First Aid Courses	484
Defensive Driving Courses	195
Junior Ranger Safety Training Courses	14
Axe and Chainsaw Courses	26
Junior Ranger Foreman Courses	6
Snowmobile Training Courses	6
Inspections (Buildings, Camps, Nurseries, etc.)	331

Information Services Branch

Exhibits

The Ministry's principal exhibit during the year was the miniature "Ontario Provincial Park" created indoors at the Canadian National Sportsmen's Show in Toronto March 16 to 25.

The indoor replica of a provincial park, complete with forest and recreation areas, promoted the opportunities offered by the 128-park provincial system. Judging by the positive reaction of more than 178,000 visitors, it was a most successful exhibit.

The Branch prepared and co-ordinated, or supported, three other major Ministry exhibits at the Central Canada Exhibition, the Lakehead Exhibition and the International Plowing Match. The Branch also assisted in exhibits and displays for 46 smaller fairs and events where the Ministry presentation was managed by field offices or program branches.

News and Features

Newsworthy material from main office and field offices was co-ordinated by the Branch and distributed to the news media. Major news releases issued totaled 96 while other releases announced grants for conservation authority projects and park assistance programs.

During serious forest fire periods, flooding seasons and other emergency situations, the Branch assisted in setting up information networks as well as delivering up-to-the-minute information as required to principal news outlets.

Outdoors Offbeat, a news feature service with photographs, was mailed periodically to news outlets, outdoor writers and selected periodicals, a total of 1,300 addresses.

Ontario Outdoors, a public service radio series, was delivered every two months to 61 Ontario stations. Each 27-minute program featured Ministry staff telling about MNR programs and services.

Staff support and guest personnel were provided for TV and radio programs throughout the Province.

Material was mailed to 49,783 persons who asked for information on Crown land, natural resources or outdoor recreation.

Publications

During the year the Ministry released 45 books or large booklets, 18 smaller booklets and six large folders, nearly all sold to the general public on a cost-recoverable basis. The publishing list included scientific papers, technical reports and numerous leaflets or small folders on Ministry services and installations.

French-language publications included the annual summaries of fishing and hunting regulations, the annual information booklet for the Junior Ranger program, hunter safety examinations and notices, and a number of leaflets and small booklets on provincial parks and district services.

New publications of main office branches and field offices included the following:

Abandoned Pits and Quarries in Ontario, Ontario Geological Survey Miscellaneous Paper 79 ($2)
An Annotated Bibliography of the Effects of Roads on Aquatic Systems, Vol II ($2.50)
Comment Obtenir un Permis de Chasse de L'Ontario
Common Diseases and Parasites of Furbearing Mammals in Ontario (50¢)
Crown Land Recreation Study, Phase 2: Future Trends and Management Options, March, 1979
Cull Survey Tables (metric)
Les Dangers que Menacent les Propriétés Riveraines (Programme Canada-Ontario)
The Effects of Highway Construction on Galt Creek, Ontario, Volumes 1 and 2 ($2.50 each)
Financing of the Junior Mining Company in Ontario ($10)
Flooding! It Can Happen To You
Forest Inventory Procedures for the Province of Ontario ($1)
Forest Nursery Soil Management and Related Practices (revised, metric) ($10)
Forest Research 77 ($1.50 to public)
Geology of the Twopeak Lake Area, District of Cochrane, Ontario Geological Survey Report 184 ($2.50)
Geoscience Research Grant Program, March, 1979
Geoscience Research Grant Program, Summary of Research 1978-9, Ontario geological Survey Miscellaneous Paper 87 ($2)
Hawk Cliff Wildlife Agreement Area
Investment Effects on the Mineral Industry of Tax and Environmental Policy Changes: A Simulation Model, Background Policy Paper No. 5 ($5)
Kakabeka Falls Provincial Park Master Plan ($2)
Lake of the Wood General Land Use Plan ($3)
Land Resources for Education Outdoors (Published jointly with Ministry of Education)
MacGregor Point Provincial Park Master Plan ($2)
Metric Conversion and Gas and Oil Exploration in Ontario
Nesting Ecology of Canada Geese in the Hudson Bay Lowlands of Ontario, Fish and Wildlife Research Report No. 98 ($3.50)
Next Time You're Shopping, Pick Up a Tree
Not Ours to Control
Oil and Gas Exploration Drilling and Production Summary, 1976, Paper 77-1 ($7.50)
The Ontario Geological Survey, Miscellaneous Paper 81 (50¢)
Ontario Mineral Review, 1976-1977 ($2)
Ontario Provincial Parks Planning and Management Policies
Proceedings of Ontario Conference on Forest Regeneration
Proceedings of the 35th Annual Conference of the Provincial Ministers of Mines (bilingual)
Provincial Park Facility Inventory
Provincial Park Training Leaflets
The Role of Smaller Enterprises in the Canadian Mineral Industry with a Focus on Ontario ($10)
Season of the Black Bear
Shore Property Hazards (Published jointly with Fisheries and Environment Canada)
Statistical Report on Mineral Industry of Ontario, 1974 ($2)
A Study of Pit and Quarry Rehabilitation in Southern Ontario, Ontario Geological Survey Miscellaneous Paper 83 ($2)
Temagami Canoe Routes ($2)
Tweed District Crown Lands
Wildflowers of Algonquin Provincial Park ($1)
Women's Affirmative Action Program

A-V and Films

Polar Bear Provincial Park, a 14-minute film produced by Information Services for Provincial Parks Branch, was chosen by the Outdoor Writers Association of America as the best conservation film released in North America in 1978. The film had earlier won a citation for creative excellence at the annual International Industrial Film Festival in Chicago. It was made for the public participation process of the master plan review.

MNR People, a 32-minute color film, was produced by the Branch to show Ministry employees at work and demonstrate their job functions. It is used for the instruction of Junior Rangers and new employees and shown to interested groups.

The Branch also produced an 18-minute film on the Ministry's popular exhibit in the Canadian National Sportsmen's Show.

A newsfilm release on the new leg-snare trap was used by three Canadian networks and all Ontario TV stations.

The motion picture library loaned 1,200 films to Ministry offices and outside groups during the year and answered more than 200 requests for the loan of projection and audio-visual equipment. It acquired 22 films, bringing the catalogue to 345.

The Branch responded to 123 requests for photography services relating to Ministry publications and research projects. The darkroom produced more than 4,000 photo prints.

Internal Audit Services Branch

The objective of the Branch is to independently review operations of the Ministry, and some of its agencies, and provide management with analysis, appraisals and recommendations concerning the activities reviewed. Audits are performed on the following:

All Ministry of Natural Resources offices
Thirty-eight Conservation Authorities
The St. Clair Parkway Commission
The St. Lawrence Parks Commission.

Legal Services Branch

During the fiscal year commencing April 1, 1978, and ending March 31, 1979, Legal Services Branch prepared and processed amendments to The Crown Timber Act (by Statutes of Ontario 1978, Chapter 51); The Game and Fish Act (by Statutes of Ontario 1978, Chapter 52); The Ministry of Natural Resources Act, 1972 (by Statutes of Ontario 1978, Chapter 92); The Mining Tax Act, 1972 (by Statutes of Ontario 1978, Chapter 82); and The Niagara Parks Act (by Statutes of Ontario 1978, Chapter 91).

Metric conversion of thirteen (13) statutes administered by the Ministry was effected through Part VIII of The Metric Conversion Statute Law Amendment Act, 1978 (Statutes of Ontario 1978, Chapter 87). The statutes affected are The Beach Protection Act, The Canada Company's Lands Act, 1922, The Conservation Authorities Act, The Forest Fires Prevention Act, The Lakes and Rivers Improvement Act, The Niagara Parks Act, The Petroleum Resources Act, 1971, The Pits and Quarries Control Act, 1971, The Public Lands Act, The St. Clair Parkway Commission Act, The Surveys Act, The Wilderness Areas Act and The Woodlands Improvement Act. All but the amendments to The Pits and Quarries Control Act, 1971, were proclaimed to be in force as of April 1, 1979.

During the fiscal year, sixty-six (66) regulations and four hundred and eighty-three (483) Orders-in-Council, made under the authority of Statutes administered by the Ministry, were prepared and processed through the Branch.

Four hundred and twenty-one (421) agreements were processed through the Branch.

Affirmative Action Program

The Affirmative Action Program was begun in 1974-5 with the goal of ensuring equal opportunity for women in the Ontario Public Service. Because of the slow rate of improvement in women's occupational status, in 1977-8 a more concrete focus was given to the program so that, while the goal remains the same, the present objective is to increase the number of women in all positions and levels where in the past few or no women were employed.

The Women's Co-ordinator is responsible for providing advice and technical assistance to managers at all levels, encouraging women to take advantage of new opportunities, co-ordinating the Ministry's Affirmative Action Plan, and monitoring and evaluating its implementation.

Various methods were used to increase understanding of the objectives and methods of the program, with greater emphasis than previously on statistics showing the slow rate of progress. Speeches by the Women's Co-ordinator to meetings of male and female staff were continued and written reports on various aspects of the program were widely distributed within the Ministry. The first two issues of a newsletter, to be produced by each Group and Region in turn, were published and distributed.

Monitoring and improvement of staffing processes continued. More Selection Boards had members of both sexes, and increasingly the female member had experience in the field concerned. A system was instituted whereby, after each competition, managers reported to the Women's Co-ordinator the criteria on which the applicants had been judged. A course to instruct managers in the best selection procedures was arranged by Personnel Branch; three sessions were held, with six projected for 1979-80.

To improve program planning, a more formal system was designed and put into operation to collect information on hiring, retention, promotion, training, job rotation and job enrichment at the District and Branch level. As well, data were collected on the numbers of females graduating from colleges and universities in resources management fields. Research on former female participants in the Junior Ranger Program showed that this experience was perceived by them to have had a positive effect on their interest in non-traditional careers.

Efforts continued to increase the numbers of women enrolling in resources management courses, and to assist them to obtain work experience. There was an increase in female Junior Rangers, to 788 from 688 in the previous year. Female summer students continued to be hired in all disciplines, and female graduates made up a fair proportion of seasonal unclassified staff.

Increasing upward mobility of present female staff is a priority of the program. The number of special courses increased; two Women into Management courses were held, and six in Career Planning and Assertiveness Training. Individual Training and Development plans were made for female employees. Job rotations and other job enrichment activities increased, as did counselling of individual women, particularly on job search techniques. An inventory of female staff with potential for more senior positions was begun.

The Ministry has a network of elected Affirmative Action representatives whose primary role is to encourage female employees to take part in opportunities available. Two three-day conferences of these representatives were held, for training, information exchange, and advice on program activities. These elected women form Affirmative Action Committees at the Group and Regional level; improvements in the status of these committees resulted in an increase in the number of women participating in program activities.

As in previous years, a slight gain was made in the proportion of women in administrative positions.

For the first time, there was a substantial increase in female professionals and technicians in positions requiring resources management training, with twice as many such women professionals (49, compared to 19 in the previous year) and more than three times as many such women technicians (15, compared to 4). Although women still held less than seven per cent of these professional positions, and less than one per cent of the technical, it is expected that the Ministry's efforts to increase the pool of women qualified for resources management positions will produce further improvements next year.

Mining and Lands Commissioner

The Mining and Lands Commissioner exercises judicial, quasi-judicial and administrative powers and duties under The Beach Protection Act, The Mining Act and The Mining Tax Act, 1972, and regulations made under The Ministry of Natural Resources Act, 1972, assigning powers and duties of the Minister to the Commissioner.

Judgments, orders and reports issued by the tribunal during the fiscal year were as follows:

Orders extending time for performing work or applying and paying for leases	858
Orders authorizing special renewal of licences	63
Miscellaneous judgements, orders and reports	73
Total number of orders	994

The potential revenue from filing extensions orders is as follows:

8,147 claims	Prior to default	$40,735.00
871 claims	Relief from forfeiture	8,710.00
		49,445.00

Hearings under The Mining Act were held at Kirkland Lake, Sault Ste. Marie, Timmins and Toronto. Three appeals were heard at Toronto under The Mining Tax Act, 1972. Appeals under The Conservation Authorities Act were heard at Brampton, Brantford, Kitchener, Orangeville, Ottawa and Toronto. One inquiry under The Lakes and Rivers Improvement Act was held at Cambridge.

Statutory Authority	**Settled or Abandoned**	**Hearings Held**
The Conservation Authorities Act	8	11
The Lakes and Rivers Improvement Act	—	1
The Mining Act	—	9
The Mining Tax Act, 1972	1	3
Total	9	24

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